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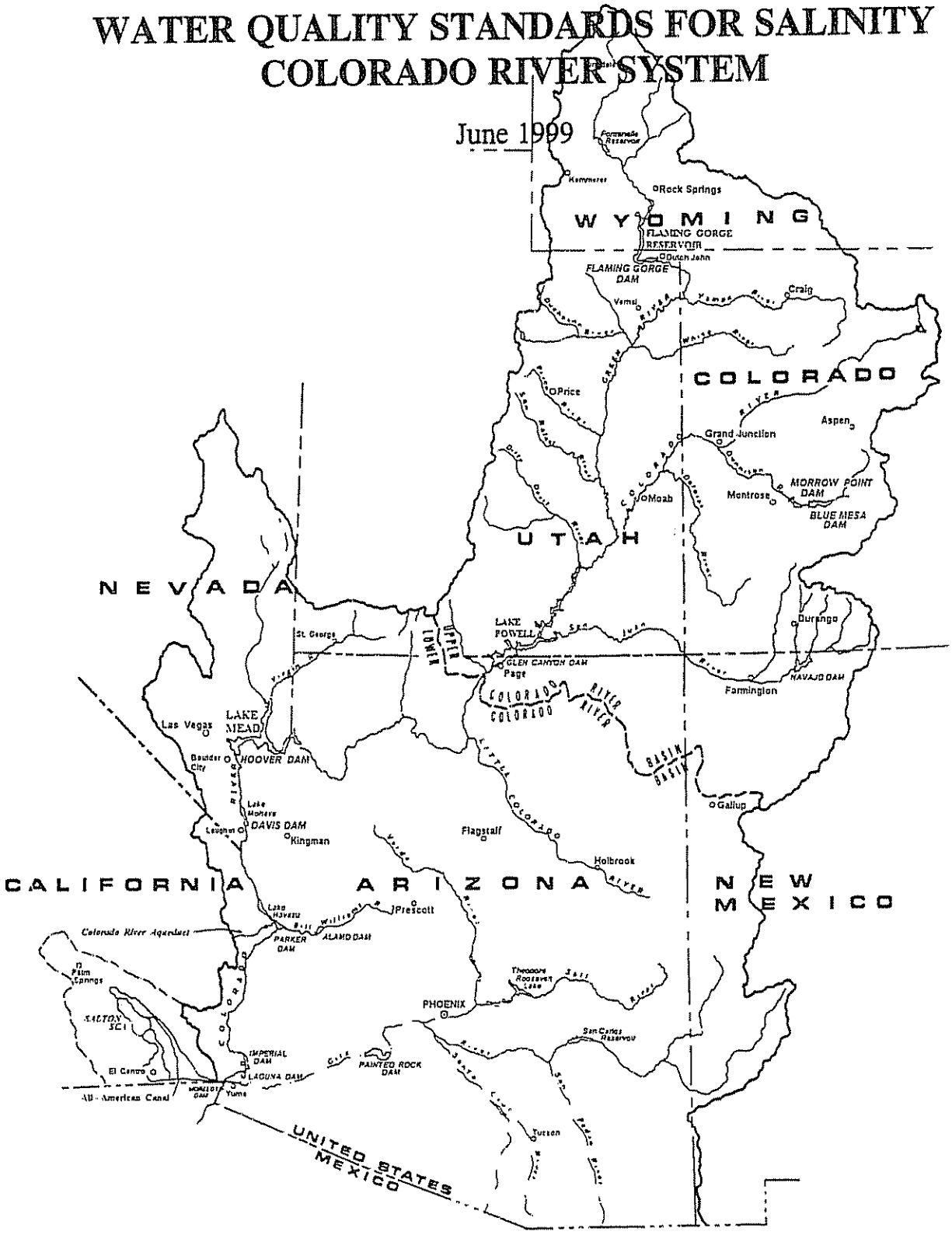
1999 REVIEW

WATER QUALITY STANDARDS FOR SALINITY COLORADO RIVER SYSTEM

June 1999



Colorado River Basin Salinity Control Forum

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June 1999

Prepared by
Colorado River Basin Salinity Control Forum

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SUMMARY

Section 303 of the Clean Water Act requires that water quality standards be reviewed from time to time, but at least once during each three-year period. Accordingly, the seven-state Colorado River Basin Salinity Control Forum (Forum) has reviewed the existing state-adopted and Environmental Protection Agency (EPA)-approved water quality standards for salinity consisting of numeric criteria and a plan of implementation for salinity control for the Colorado River System. Since the issuance of the 1996 Review, the U.S. Bureau of Reclamation (Reclamation) has initiated development of a new model to analyze the Colorado River System, including salinity. The model development is not yet completed, and new salinity projections are not available for this Review. Projections developed for the 1996 Review are used in this Review. This 1999 Review updates funding and salinity control component implementation requirements following 1999. Also, since the 1996 Review, federal legislation has been implemented which allows the Basin states to cost share up-front in both Reclamation's Basinwide Program and the U.S. Department of Agriculture's EQIP program. This has brought a new and important source of funding to the program and has accelerated the rate of implementation of salinity control measures. Federal authorization given by Congress in 1996 has already allowed for the addition of $6,476,000 to the effort. The Forum's recommendations are to be submitted to each of the Basin states for consideration at a public hearing prior to adoption.

The Forum recommends no change in the numeric salinity criteria at the three stations located on the lower mainstem of the Colorado River. The numeric criteria at these stations will remain:

Station	Salinity in mg/L[1]
Below Hoover Dam	723
Below Parker Dam	747
At Imperial Dam	879

The plan of implementation as set forth in this Review is designed to meet the objective of maintaining the salinity concentrations at or below the numeric criteria while the Basin states continue to develop their compact-apportioned waters. The plan is based on maintaining the numeric criteria under a long-term mean water supply of 15 million acre-feet annually at Lee Ferry, the Compact Point. The Forum recommends that the plan of implementation described in this report be carried out. The plan of implementation includes:

1. Completion of Reclamation, Bureau of Land Management (BLM), and U.S. Department of Agriculture (USDA) salinity control measures to the extent that each unit remains viable and appropriately cost-effective.

[1]Flow-weighted average annual salinity.

2. Implementation of the Forum's recommended and adopted policies for effluent limitations, principally under the National Pollutant Discharge Elimination System (NPDES) permit program established by Section 402 of the Clean Water Act as amended. The implemented policies (included in Appendix B of this Review) are the following:

   "Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program;"

   "Policy for Use of Brackish and/or Saline Waters for Industrial Purposes;"

   "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Ground Water;" and

   "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Fish Hatcheries."

3. Implementation of nonpoint source management plans developed by the states and approved by EPA.

Item 1 of the plan listed above is to be implemented by federal agencies in conjunction with state, local, and private participants. The Forum works jointly with federal agencies on developing measures to be implemented. The Forum also urges Congress to ensure that the funds necessary to successfully fulfill this plan of implementation are appropriated as needed. Items 2 and 3 above are primarily implemented by each of the Basin states.

Major components of this Review's plan of implementation are the federal programs. Table 1 summarizes the salinity control achieved by federal participants through 1998, and the salinity control measures which must be implemented to meet the goal of approximately 1.477 million tons of salt-load reduction annually through 2015. As 1.105 million tons of salt load reduction was required by 1998, and only 721,000 tons of salt load reduction was achieved, a shortfall of 384,000 tons must be made up. In order to do so, the Forum recommends that salinity control be accelerated to remove 87,000 tons/year through 2005. This includes removing at least 64,000 tons/year over the next six years, through the funding recommendations herein, to eliminate the shortfall, and 23,000 tons/year through the remaining period to maintain the numeric criteria through 2015. The federal programs are described in detail in Chapter 4 of this Review.

The plan of implementation is designed to control enough salt to maintain the numeric criteria under a long-term mean water supply of 15 million acre-feet per year. It is recognized that the river system is subject to highly variable flows. Consequently, salinity will vary from year to year and may temporarily exceed the adopted numeric criteria in some years and remain well below the criteria in others.

Table 1
Colorado River Basin Salinity Control Program
Plan of Implementation
By 2015
(Values in Tons of Salt Load Reduction Per Year)

AGENCY	MEASURES IN PLACE	POTENTIAL NEW MEASURES	TOTAL
Bureau of Reclamation	421,000	501,000	922,000
U.S. Department of Agriculture	262,000	242,000	504,000
Bureau of Land Management	38,000	13,000	51,000
TOTAL	721,000	756,000	1,477,000

Salinity concentrations at the three stations on the Lower Colorado River in 1997 were:

Station	Salinity Concentration[1] in mg/L
Below Hoover Dam	588
Below Parker Dam	609
At Imperial Dam	713

Based on the data available, the Forum concludes that the measured salinity will not exceed the numeric criteria during the next three years. The plan of implementation adopted herein by the Forum provides for the control of about 1.477 million tons of salt load reduction annually by the year 2015.

Should more water development projects be completed than are projected to occur before salinity control measures are identified or brought on line, temporary increases above the numeric criteria could result. However, these increases will be deemed in conformance with the standards if appropriate salinity control measures are included in the plan.

Increases above the criteria as a result of below normal annual river flows and/or low reservoir storage conditions will also be considered in conformance with the standards, provided that

[1]Flow-weighted data based on 1997 provisional records.

when river flows return to normal, and satisfactory reservoir conditions prevail, concentrations will then be at or below the criteria level.

The Forum has reviewed the impact of the program on projected salinities and finds that through the year 2015 the plan will control salinity levels so that, with long-term mean water supply conditions, salinity levels will be below the numeric criteria at the three stations. The salinity standards provide protection from long-term increases in economic damage to downstream users.

Because of the long lead-time required to conduct salinity studies; complete environmental and feasibility reports; implement; and achieve full salinity reduction effects at the lower Colorado River mainstem stations, continued funding is necessary for the recommended plan of implementation to proceed as set forth in this Review. Non-federal funds, including Basin states' basin funds, are available to cost-share with federal appropriations, and Basin irrigators stand ready with cost-share dollars to install salinity reducing measures.

Table of Contents

List of Abbreviations

208 Plan	Section 208 of the Clean Water Act amendments of 1972 and 1977 requiring integrated area-wide plans and programs for dealing with water pollution problems
ADEQ	Arizona Department of Environmental Quality
AWT	Advanced Waste Treatment
BCC	Nevada's Clark County Board of Commissioners
BLM	United States Bureau of Land Management
BMI	Basic Management Inc.
CCSD	Clark County Sanitation District
CLV	City of Las Vegas
CNLV	City of North Las Vegas
CRM	Coordinated Resource Management (group)
CRSS	Colorado River Simulation System
CSCB	Colorado Soil Conservation Board
CWA	Clean Water Act
DEQ	Wyoming Department of Environmental Quality
DPA	Designated Planning Agency
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESI	Ecological site inventory
FAIRA	Federal Agriculture Improvement and Reform Act (P.L. 104-127) (1996)
Forum	Colorado River Basin Salinity Control Forum
FY	The federal government's Fiscal Year
HMA	Herd Management Area
IBWC	International Boundary and Water Commission
MGD	Million gallons per day
mg/L	milligrams per liter
NACOG	Northern Arizona Council of Governments
NDEP	Nevada Division of Environmental Protection
NEPA	National Environmental Policy Act
NMWQMP	New Mexico Water Quality Management Plan
NPSMP	Nonpoint Source Management Plan (New Mexico)
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRI	National Resource Inventory
ppm	parts per million
Reclamation	U.S. Bureau of Reclamation (USBR)
RMHQ	Requirements to Maintain Higher Quality (in Nevada)
RO	Regional Office
SRF	State Revolving Fund (EPA low-interest loans for non-point sources)
TDS	Total dissolved solids
The Act	The Colorado River Basin Salinity Control Act (P.L. 93-320) (1974), as amended by P.L. 98-569 (1984), and P.L. 104-20 (1995).
TMDL	Total Maximum Daily Load
T/AF	Tons per Acre-foot

UIC	Underground Injection Control (EPA)
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
UWA	Unified Watershed Assessment (part of Clean Water Action Plan)
WACOG	Western Arizona Council of Governments
WLA	Waste Load Allocation
WQCC	Water Quality Control Commission (Colorado)

CHAPTER 1 - INTRODUCTION

Purpose of Report

This report, the 1999 Review, Water Quality Standards for Salinity, Colorado River System (Review) is prepared and submitted in response to Section 303(c) of the Clean Water Act[1]. Prepared by the seven-state Colorado River Basin Salinity Control Forum (Forum), on behalf of the governors of their respective states, this Review of the water quality standards includes the numeric criteria and the plan of implementation developed and adopted by the Forum. It also includes modifications to previous reviews that have become necessary as a result of changed conditions and the availability of additional information. This Review is the eighth triennial review conducted by the Forum. Section 303(c)(1) of the Clean Water Act requires that:

> *The governor of a state or the state water pollution control agency of such state shall from time to time (but at least once each three-year period beginning with the date of enactment of the Federal Water Pollution Control Act Amendments of 1972) hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. Results of such review shall be made available to the Administrator.*

This Review is consistent with the Environmental Protection Agency (EPA)-approved 1975 standards and deals only with that portion of the Colorado River Basin above Imperial Dam. While this Review will recap past events in an abridged format, its focus is on information gathered since issuance of the 1996 Review. Background information and activities regarding historical actions relative to the development and adoption of salinity standards is contained in the June 1975 standards report[2]. The prior seven Reviews, from 1978 to 1996, contain more specific information on the seven 3-year periods.

Below Imperial Dam, salinity is controlled as a federal responsibility to meet the terms of the agreement with Mexico contained within Minute No. 242 of the International Boundary and Water Commission (IBWC), entitled "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River." Minute No. 242 requires that measures be taken to assure that Colorado River water delivered to Mexico upstream from Morelos Dam will have an average annual salinity concentration of no more than 115 ± 30 parts per million (ppm) total dissolved solids (TDS) higher than the average annual salinity concentration of Colorado River water arriving at Imperial Dam.

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[1]Public Law [P.L.] 92-500 as amended by P.L. 95-217 and P.L. 100-4

[2]Water Quality Standards for Salinity, Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System, Colorado River Basin Salinity Control Forum, June 1975.

Nothing in this report shall be construed to alter, amend, repeal, interpret, modify, or be in conflict with the provisions of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River Basin Project Act (82 Stat. 885), the Colorado River Compact, the Colorado River Storage Project Act (70 Stat. 105), the Upper Colorado River Basin Compact, or the Treaty with the United Mexican States (Treaty Series 994).

History and Background

In the 1960's and early 1970's, the seven Colorado River Basin states[1] and representatives of the Federal Government discussed the problem of salinity levels increasing in the lower reaches of the Colorado River. In 1972, the Federal Government enacted the Clean Water Act which mandated efforts to maintain water quality standards in the United States. At the same time, Mexico and the United States were discussing the increasing salinity of Colorado River water being delivered to Mexico.

The Basin states established the Colorado River Basin Salinity Control Forum in 1973. The Forum is composed of representatives from each of the seven Basin states appointed by the governors of the respective states. The Forum was created for interstate cooperation and to provide the states with the information necessary to comply with Section 303(a) and (b) of the Clean Water Act.

Congress enacted the Colorado River Basin Salinity Control Act (P.L. 93-320) (the Act) in June of 1974 with the Forum's support. Title I of the Act addresses the United States' commitment to Mexico and provided the means for the United States to comply with the provisions of Minute No. 242. Title II of the Act created a water quality program for salinity control in the United States. Primary responsibility for the federal program was given to the Secretary of the Interior, with the Bureau of Reclamation (Reclamation) being instructed to investigate and build several salinity control units. The Secretary of Agriculture was instructed to support the effort within existing authorities (see Chapter 4 for more detail regarding these authorities).

The EPA promulgated a regulation in December 1974, which set forth a basinwide salinity control policy for the Colorado River Basin. The regulation specifically stated that salinity control was to be implemented while the Basin states continue to develop their compact-apportioned water. This regulation also established a standards procedure, and required the Colorado River Basin states to adopt and submit for approval to the EPA water quality standards for salinity, including numeric criteria and a plan of implementation, consistent with the policy stated in the regulation. A copy of the regulation is included in Appendix A.

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[1]The seven Colorado River Basin states (Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming) are referred herein as the "Basin states."

The Basin states, acting through the Forum, initially responded to this regulation by developing and submitting to the EPA a report entitled Water Quality Standards for Salinity Including Numeric Criteria and Plan of Implementation for Salinity Control - Colorado River System dated June 1975. Since the states' initial adoption, the water quality standards have been reviewed every three years (1978, 1981, 1984, 1987, 1990, 1993 and 1996) as required by Section 303(c)(1) of the Clean Water Act.

The Colorado River Basin Salinity Control Act was amended in 1984 by P.L. 98-569 to authorize two additional units for construction by Reclamation. The amendments directed the Secretary of the Interior and the Secretary of Agriculture to give preference to the salinity control units with the least cost per unit of salinity reduction. The Act was also amended to establish a voluntary on-farm salinity control program to be implemented by the Department of Agriculture and provided for voluntary replacement of incidental fish and wildlife values foregone on account of the on-farm measures. Many cost-effective salt-load reducing activities were accomplished in the decade following that authorization. P.L. 98-569 also directed the Bureau of Land Management (BLM) to implement salinity controls.

Reclamation and the Forum, in 1994, concluded that the existing Act, as amended, with its unit-specific approach and authorization ceiling, was limiting salinity control opportunities. In 1995, the Act was amended by P.L. 104-20 to authorize an entirely new way of implementing salinity control. Reclamation's new Basinwide Salinity Control Program opens the program to competition through a public process and has greatly reduced the cost of salinity control. An additional $75 Million of expenditures by Reclamation were authorized by P.L. 104-20.

The Federal Agriculture Improvement and Reform Act (FAIRA) of 1996 (P.L. 104-127) further amended the U.S. Department of Agriculture's (USDA) role in salinity control by creating a new conservation program known as the Environmental Quality Incentives Program (EQIP) which combined four conservation programs, including USDA's Colorado River Basin salinity control program. FAIRA provided authority for funding the nationwide EQIP through the year 2002. USDA has created rules and regulations concerning how EQIP funds are to be allocated. The past authority for the states to cost-share from the Basin funds was retained in the new EQIP program with linkage to Reclamation's authority to distribute Basin funds for cost-sharing.

Figure 1-1 displays a cumulative estimation of the annual salt removal by the Colorado River Basin salinity control program.

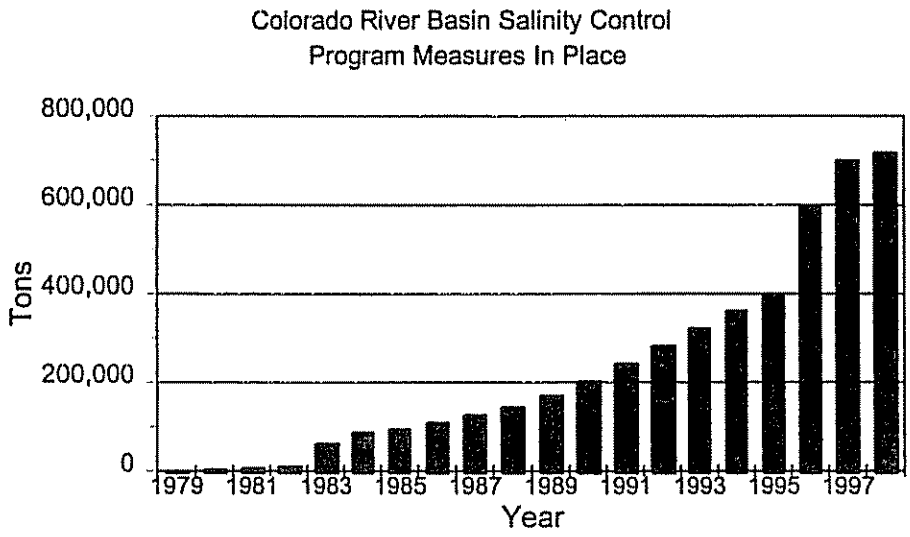

Figure 1-1

Overview of Standards

The Forum proposed, the states adopted, and the EPA approved water quality standards in 1975, including numeric criteria and a plan of implementation, to control salinity increases. The standards require that a plan be developed which will maintain the flow-weighted average annual salinity at or below the 1972 levels while the Basin states continue to develop their compact-apportioned water supply. The Forum selected three stations on the mainstem of the lower Colorado River as being appropriate points to measure the salinity of the Colorado River. These stations are located at the following points on the Colorado River: (1) below Hoover Dam; (2) below Parker Dam; and (3) at Imperial Dam. Numeric criteria were established for these points as required by the 1974 regulation. A plan of implementation was also developed in 1975 by the Forum and participating federal agencies as part of the standards. It was designed to ensure compliance with the numeric criteria for salinity. The numeric criteria and plan of implementation are further described in Chapters 3 and 4 of this Review. During each triennial review, the numeric criteria are reviewed and the plan of implementation is updated to ensure continuing compliance with the standards.

The Colorado River water quality standards for salinity, and the approach taken by the Basin states in complying, are unique. The Forum relied on the Basin states' projections of use of compact-apportioned waters. The salinity projections are based on the long-term mean water supply of 15 million acre-feet per year. The plan of implementation is revised as necessary to ensure compliance with the standards.

Program Funding

Adequate funding is required to meet the standards. Funds are provided from federal and non-federal sources. Federal appropriations, Basin states cost-share funds, and local participant funds are used to implement the Colorado River Basin Salinity Control Program. The Basin states and the local producers have funds available and stand ready to implement the program called for in this report.

Figure 1-2 shows federal appropriations for the Colorado River Basin salinity control program over the past twelve years. Annual appropriations to Reclamation were as large as $34,566,000 as recently as 1992, but in 1998 they were only $7,600,000. Because of improved cost effectiveness, the Basin states believe the appropriation to Reclamation can be smaller than in the past, but find that about $17,500,000 is needed each year through the planning period of this report. An increased funding ceiling is now needed for the Reclamation program.

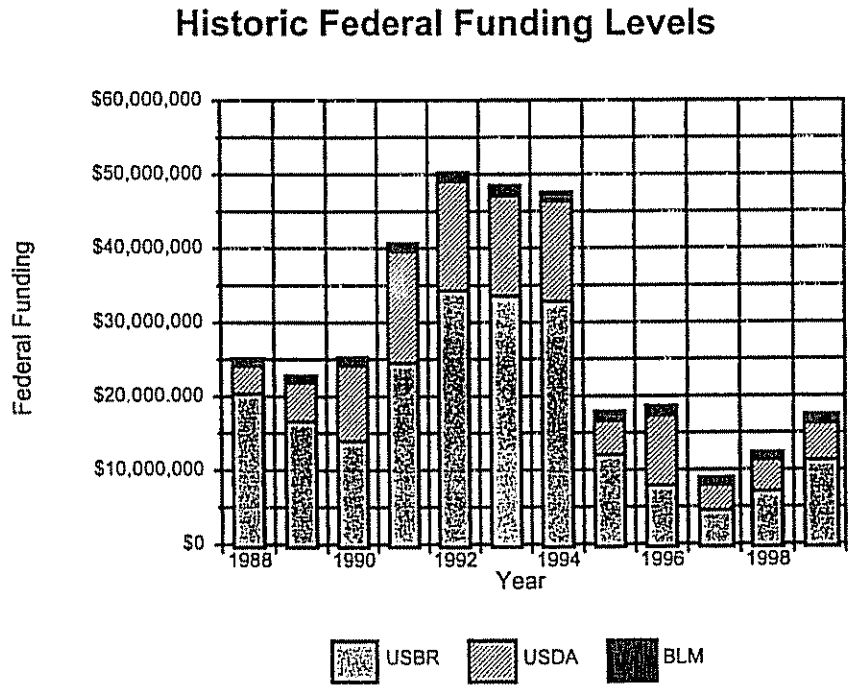

Figure 1-2

Following the passage of FAIRA in 1996, federal funding is provided to USDA each year for distribution for environmental enhancement efforts through the nationwide EQIP. In 1991 and 1992, when salinity control was a separate line-item, $14,783,000 was made available to the USDA's Colorado River Basin salinity control program by Congress, but in 1998 and 1999 USDA allocated only $3.9 million and $5.1 million. A solution to this under-funding problem is for USDA to designate the Colorado River Basin as a national conservation priority area and increase funding to the Colorado River salinity control activities of EQIP to $12 Million per year.

BLM has an important role to play in controlling salt contributions from nonpoint sources from the very sizeable amount of federal land it manages. Accounting procedures used by BLM have not allowed for an analysis to occur as to expenditures for salinity controls measures being implemented by the agency. Recent efforts by BLM staff to determine the effects of management practices being implemented is providing new information and it is hoped that in the near future BLM accomplishments can be estimated and the adequacy of the effort and the level of funding for the activities can be evaluated.

The EPA has programs that give financial assistance to the states to implement nonpoint source pollution control efforts. Recently, the federal assistance has been increased and now the salinity control effects of these efforts need to be evaluated.

CHAPTER 2 - SALINITY OF THE RIVER

Overview

The Colorado River drains 246,000 square miles (approximately 157 million acres) of the western United States and a small portion of northern Mexico. Its waters serve some 5.5 million people within the United States' portion of the Colorado River Basin, and through export provides full or supplemental water supply to another 22.3 million people outside the Basin. The regional economy is based on irrigated agriculture, livestock grazing, mining, forestry, manufacturing, oil and gas production, recreation and tourism. About 3.5 million acres are irrigated within the Colorado River Basin and hundreds of thousands of additional acres are irrigated by waters exported from the Basin. Hydroelectric power facilities along the Colorado River and its tributaries generate approximately 12 billion kilowatt-hours annually which is used both inside and outside of the Basin. The Colorado River also serves about 2.3 million people and 500,000 irrigated acres in Mexico.

Salinity has long been recognized as one of the major problems of the river. The Colorado, like most western rivers, increases in salinity from its headwaters to its mouth, carrying an average salt load of approximately nine million tons annually past Hoover Dam, the uppermost location at which numeric criteria have been established. In addition to total salt load which measures the total mass of salt carried in the River (tons/year), this report also examines salinity in terms of concentration as expressed in milligrams per liter (mg/L).

The salts in the Colorado River system are indigenous and pervasive. Many of the saline sediments of the Basin were deposited in prehistoric marine environments. Salts deposited with the sedimentary rocks are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system.

In a 1971 study[1], the EPA analyzed salt loading in the Colorado River Basin and divided it into two categories, naturally occurring and human-caused. The EPA concluded that about half (47 percent) of the salinity concentration measured in water arriving at Hoover Dam is from natural causes including salt contributions from saline springs, ground water discharge into the river system (excluding irrigation return flows), erosion and dissolution of sediments, and the concentrating effects of evaporation and transpiration. The natural causes category also included salt contributions from nonpoint (excluding irrigated agriculture) or unidentified sources or from the vast, sparsely-populated regions of the drainage, much of which is administered by the BLM or other governmental agencies. Of the land within the Colorado River Basin, about 75 percent is owned and administered by the Federal Government or held in trust for Indian tribes. The greatest portion of the naturally-occurring salt load originates on these federally-owned and administered lands. Human

[1] The Mineral Quality Problem in the Colorado River , Summary Report, Environmental Protection Agency, Regions VIII and IX, 65 pp., 1971.

activities can influence the rate of natural salt movement from rock formations and soils to the river system and include: livestock grazing, wildlife management, logging, mining, oil exploration, road building, recreation and urbanization.

Approximately 53 percent of the salinity concentration in the water arriving at Hoover Dam, as identified by EPA, results from various human activities. EPA estimated that out-of-Basin exports account for about 3 percent of the salt concentration at Hoover Dam, with irrigation accounting for 37 percent, reservoir evaporation and phreatophyte use accounting for about 12 percent, and about 1 percent attributed to municipal and industrial uses. Much of the salt load contribution from irrigated agriculture is from federally-developed irrigation projects.

Salinity control activities necessarily include a water quality monitoring and analysis component that provides basinwide information for program evaluation. The monitoring and analysis component provides an essential database for future studies, supports state and regional planning activities, and provides an objective basis for evaluating the effectiveness of salinity control measures.

Continuing evaluations of the salinity of the Colorado River are made by Reclamation, the U.S. Geological Survey (USGS) and the Bureau of Land Management (BLM). The results of several studies were published by the agencies during the period of this Review (1996-1999). To evaluate changes in salinity, water quality and streamflow data are obtained on a daily, weekly, monthly, and/or quarterly basis at various points on streams throughout the Basin by the USGS in cooperation (through financial and/or direct services) with private entities, the states and other federal agencies. Gaging stations in the Colorado River Basin which are of significance to the programs and for which streamflow and water quality records are available are shown on Figure 2-1.

Salinity data are based on total dissolved solids (TDS) as the sum of constituents, whenever possible. The sum of constituents values are defined to include calcium, magnesium, sodium, chloride, sulfate, a measure of the carbonate equivalent of alkalinity and, if measured, silica and potassium. If a sum of constituents value could not be computed, TDS as residue on evaporation (at 180 degrees Celsius) is substituted. Further, some reported salinity values are based on correlation with specific conductance measurements. In this Review, the terms "salinity," "TDS" and "concentration" in mg/L are used interchangeably.

Average annual salinity concentrations and salt loads are determined on the basis of a flow-weighted average annual salinity concentration. The flow-weighted average annual salinity is simply the concentration determined from dividing the annual total salt load passing a measuring station by the total annual volume of water passing the same point during a calendar year. The flow-weighted average annual salinity is calculated by first multiplying the daily concentration values by the daily flow rates. These values are then summed over a calendar year and then divided by the sum of the daily flow rates.

MONITORING STATIONS

1 Green River near Green River, WY
2 Green River near Greendale, UT
3 Yampa River near Maybell, CO
4 Duchesne River near Randlett, UT
5 White River near Watson, UT
6 Green River near Green River, UT
7 San Rafael River nr Green River, UT
8 Colorado River nr Glenwood Springs
9 Colorado River near Cameo, CO
10 Gunnison River near Grand Jct, CO
11 Dolores River near Cisco, UT
12 Colorado River near Cisco, UT
13 San Juan River near Archuleta, NM
14 San Juan River near Bluff, UT
15 Colorado River at Lees Ferry, AZ
16 Colorado River near Grand Canyon
17 Virgin River at Littlefield, AZ
18 Colorado River below Hoover Dam
19 Colorado River below Parker Dam
20 Colorado River at Imperial Dam

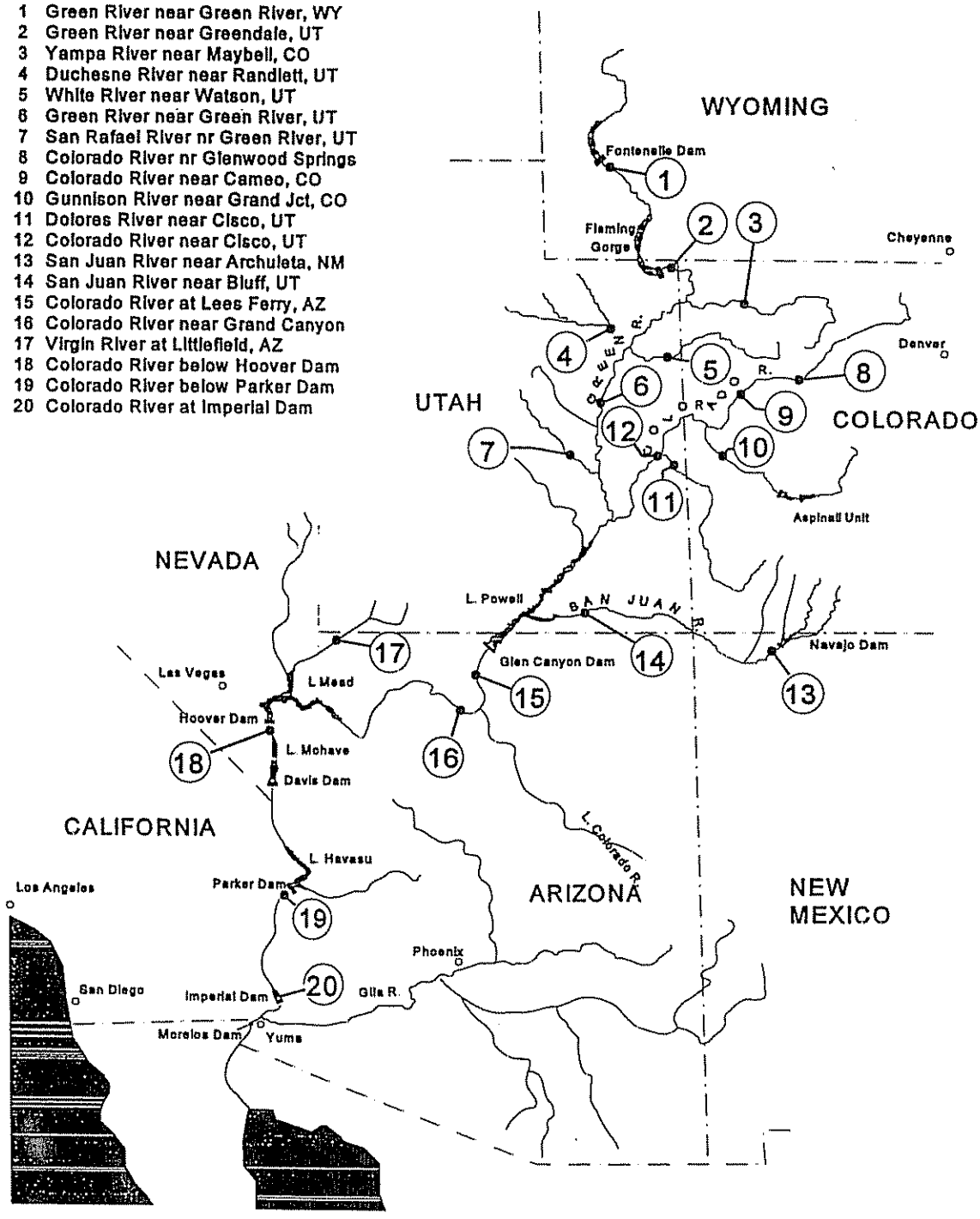

Figure 2-1.—Colorado River water quality monitoring stations.

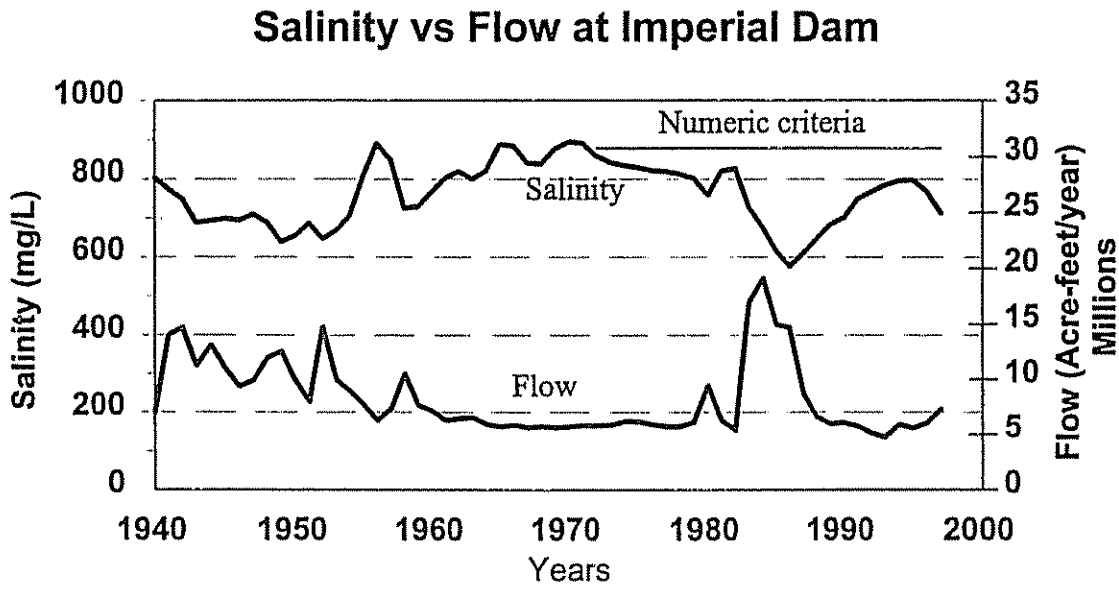

Figure 2-2

Observed Salinity

Salinity of the river has fluctuated significantly over the period of record (1941-1997; Figure 2-2). Salinity generally decreases in periods of high flow and increases in periods of low flow as can be seen in Figure 2-2.

Record high flows during the mid-1980's resulted in a reduction in salinity of approximately 250 mg/L at Imperial Dam. Conversely, the period from 1988 to 1992 was the driest five years of record historically observed. As a result, salinity in the River gradually increased. Table 2-1 shows the flow-weighted salinity from 1972 to 1997 below Hoover and Parker Dams, and at Imperial Dam.

Water Use and Associated Impacts of Salinity

The Colorado River, from its headwaters in the Rocky Mountains to its mouth in the Gulf of California, is utilized for a variety of purposes. A portion of the flow is transported out of the Colorado River Basin for use in adjacent river basins. In the Colorado River Basin, irrigation, municipal and industrial, hydroelectric power generation, power plant cooling, fish and wildlife, and recreation are the major uses of the water.

Table 2-1
Observed Flow-Weighted Average Salinity
at the Numeric Criteria Stations
(Total Dissolved Solids in mg/L)[1]

Calendar Year	Below Hoover Dam	Below Parker Dam	At Imperial Dam
1972	724	734	861
1973	675	709	843
1974	681	702	834
1975	680	702	829
1976	674	690	822
1977	665	687	819
1978	678	688	812
1979	688	701	802
1980	691	711	760
1981	681	716	821
1982	680	713	826
1983	658	678	727
1984	597	611	675
1985	556	561	615
1986	517	535	577
1987	519	538	612
1988	529	540	648
1989	564	559	683
1990	587	600	702
1991	629	624	749
1992	658	651	767
1993	660	631	784
1994	668	673	796
1995	655	665	797
1996[2]	619	648	768
1997	588	609	713

Colorado River water users in the Lower Basin have suffered significant economic impacts due to long-term continued use of water with elevated salinity levels. Figure 2-3 indicates salinity damages resulting from long-term continued use at various levels of salinity based on a 1988 Bureau of Reclamation (Reclamation) study. At current salinity levels, as shown in Figure 2-3, these damages are estimated to be in excess of $600 million per year. The Metropolitan Water District

[1]Determined by the U S. Geological Survey (USGS) from data collected by the U.S. Bureau of Reclamation and USGS and published in *Quality of Water, Colorado River Basin, Progress Report No. 19*, 1999

[2]Data for 1996 and 1997 based upon provisional records.

of Southern California (Metropolitan) recently refined the estimate of salinity damages for its service area as an element of a Metropolitan-Reclamation Salinity Management Study. Considering this work, Reclamation is currently refining the estimate of salinity damages in other portions of the Lower Colorado River Basin.

Agricultural water users suffer economic damage as a result of using highly saline waters through reduced crop yields, added labor costs for irrigation management, and added drainage requirements. Urban users incur additional costs due to more frequent replacement of plumbing and water using appliances, use of water softeners and the purchase of bottled water. Industrial users and water treatment and waste water utilities incur reductions in the useful life of system facilities and equipment from higher levels of salinity.

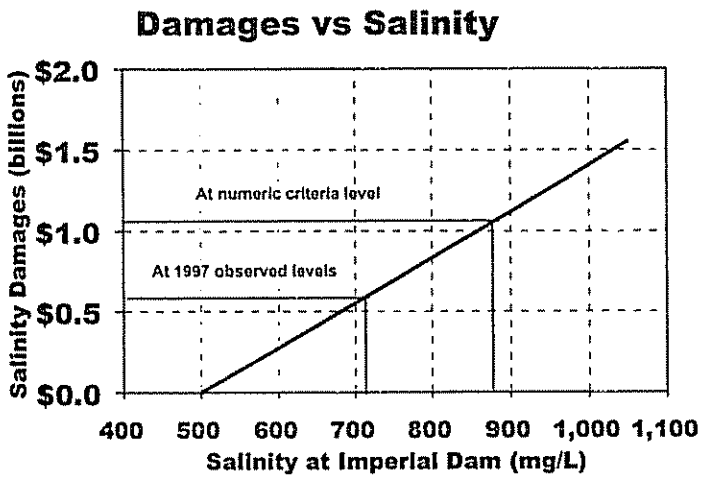

Figure 2-3

A significant economic impact in the Lower Basin results from the regulatory restrictions imposed by local and regional water quality standards and management programs which protect ground water supplies. Regulatory agencies have placed restrictions on reuse or recharge of waters that exceed specified salinity levels. If the salinity levels of the Colorado River increase, these regulatory actions result in additional expensive treatment of water prior to reuse or disposal instead of reuse of the waters. If disposal options are selected, additional costly water must be developed or imported to meet the demands previously met or that could be met by water reuse.

Projections

Future Water Depletions

One of the significant factors affecting salinity concentrations is water use. Estimates of projected water use through the year 2015 were developed by the Basin states for the 1996 Review. Table 2-2 presents a summary of these estimated water depletions in the Upper Colorado River Basin, and from the mainstem of the Lower Colorado River.

Table 2-2
Summary of Projected Normal Year Water Depletions in the Colorado River Basin[1]
(1,000 acre-feet)

	2000	2005	2010	2015
Upper Basin[2]	3,935	4,103	4,270	4,380
Lower Basin[3]	7,500	7,500	7,500	7,500
Total	11,435	11,603	11,770	11,880

Existing Salinity Conditions

The goal of the Colorado River Basin Salinity Control Program is to maintain the flow-weighted average annual salinity at or below the numeric criteria. The effort is not intended to counteract the salinity fluctuations that are a result of the highly variable flows caused by short-term climatic variations in temperature, precipitation, and snowmelt. Therefore, to evaluate the effectiveness of the Colorado River Basin Salinity Control Program, salinity data were analyzed and adjusted by removing the effects of these variations to better understand program effectiveness under long-term mean water supply conditions.

This adjusted data was used to evaluate whether current salinity control efforts are sufficient to meet the numeric criteria of the salinity standards under the current and projected levels of water development in the Basin. Table 2-3 compares the numeric criteria with the observed data and adjusted salinity levels at the three Lower Basin monitoring stations.

Figures 2-4, 2-5 and 2-6 summarize data from past Reclamation progress reports[4], comparing the adjusted salinity (to reflect long-term mean water supply) to the numeric criteria.

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[1]Source: Depletion projections prepared by Basin States for CRSS salinity simulations (Oct. 1995).

[2]Depletions at point of use. Data do not include Colorado River Storage Project reservoir evaporation estimated by Reclamation to average 520,000 acre-feet per year under full development.

[3]Lower Colorado River mainstem only. Diversions from the mainstem less returns. Data do not include mainstem reservoir evaporation and stream losses.

[4]Quality of Water, Colorado River Basin, Progress Report, No. 1 through 19.

Table 2-3
Comparison of Salinity Concentrations to the Numeric Criteria for the Existing Level of Water Development and Salinity Control

Station	Numeric Criteria (mg/L)	Adjusted Salinity[1] (mg/L)	Observed Salinity[2] (mg/L)
Colorado River below Hoover Dam	723	756	588
Colorado River below Parker Dam	747	775	609
Colorado River at Imperial Dam	879	882	713

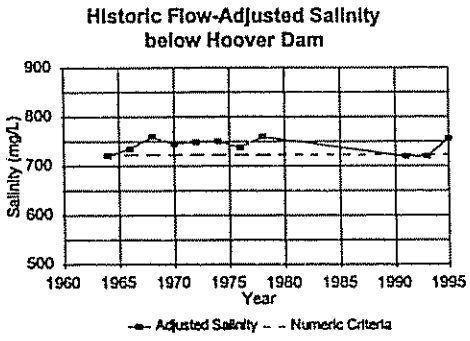

Figure 2-4

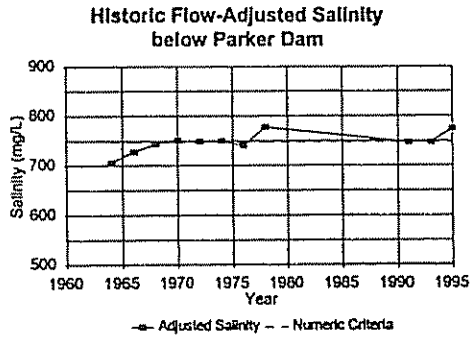

Figure 2-5

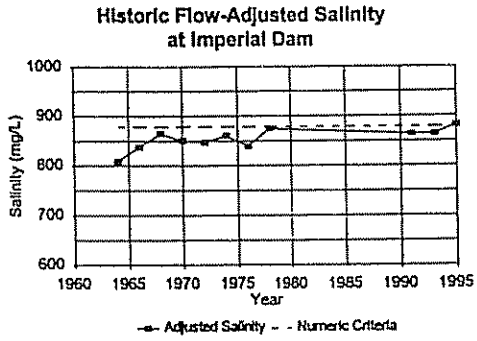

Figure 2-6

[1]Reflects salinity that would have occurred in 1995 from long-term mean water supply as computed by CRSS.

[2]1997 data based on provisional records.

at the three water quality stations through time. Adjusted salinity values were not computed for the period 1980 through 1990. The figures show that at times in the past adjusted salinity values were above the numeric criteria.

Future Salinity Projections

For past Reviews, salt-routing studies were conducted using the Colorado River Simulation System (CRSS) developed by Reclamation.[1] The CRSS is a package of computer models and databases developed by Reclamation as a tool for use by water resource managers dealing with water-related issues and problems in the Colorado River Basin. Previous studies were conducted to provide estimates of future flow-weighted average annual salinity concentrations for each year of the study period below Hoover and Parker Dams and at Imperial Dam in the Lower Basin.

Currently, Reclamation is developing a new model to analyze the Colorado River System, including salinity. This is an ongoing process that is intended to provide a better tool for projecting future salinity concentrations. Because the model is not completed, new projections are not available for this Review. Projections developed for the 1996 Review are used in this Review. This analysis determined the salinity program would need an estimated total of 1,477,000 tons of salinity control, as is shown in Table 2-4, in order to meet the numeric criteria in 2015 at the Hoover station. This represents 756,000 tons beyond the existing 721,000 tons of salinity control. This includes a shortfall of 384,000 tons of salinity control that were to be in place by 1998 to offset estimated development. Based on comments received during the 1996 Review, the Forum has determined that the shortfall should be eliminated as soon as possible and at least within the next six years. The plan of implementation has been developed to remove at least 87,000 tons/year through 2005. This includes 64,000 tons/year to eliminate the shortfall and the 23,000 tons/year needed to maintain the numeric criteria through 2015 (see page 4-2 for funding recommendations).

[1]Detailed information on CRSS is presented in the following Reclamation reports: *Colorado River Simulation System, An Executive Summary* (October 1981); *Colorado River Simulation System, Users Manual* (June 1982); and Colorado River Simulation System, System Overview (1984).

Table 2-4
Salinity Control Requirements

1998 Salinity Control Requirements		
	Requirements	1,105,000 tons/year
	Measures in Place	721,000 tons/year
	Shortfall	384,000 tons/year
2015 Salinity Control Requirements		
	Requirements	1,477,000 tons/year
	Measures in Place through 1998	721,000 tons/year
	Plan of Implementation Target	756,000 tons/year

Future salinity concentrations will depend not only upon human activities but upon natural phenomena, such as runoff conditions, natural evapotranspiration, and dissolution and mixing within the major storage reservoirs. Even with full implementation of the Colorado River Basin Salinity Control Program's current Plan of Implementation which offsets the human impacts since 1972 and through 2015, the actual concentrations at the three numeric criteria stations (and elsewhere in the Basin) will continue to fluctuate in response to hydrologic conditions.

Exceedance Evaluation

A statistical analysis was performed for the 1996 Review and reproduced in this Review in order to determine the effectiveness of the program in maintaining the numeric criteria. The analysis evaluated four conditions of various levels of salinity control ranging from no controls to implementing the Plan. Data were developed which indicate the frequency of occurrence of various mean annual salinity concentrations. Provided the salinity control measures in the Plan of Implementation are in place, the mean annual flow-weighted salinity concentrations at the three lower mainstem stations would be at or below the numeric criteria, with Hoover Dam being the controlling station. This statistical analysis can be found in Appendix C of the 1996 Review.

Impacts of Hydrology

Beyond the exceedance percentages shown in Appendix C of the 1996 Review which show how often various salinity levels should be attained, it is important to understand that annual salinity concentrations may remain depressed or elevated for a period of time. The historical plot of salinity at Imperial Dam shown in Figure 2-2 earlier in this Review effectively demonstrates this.

updated or amended. The Forum is unable to predict when the Regional Board will complete this process.

Other Activities: State Water Resources Control Board policy 75-58 established priorities for the use of poor quality waters for cooling of inland power plants, and has been in effect since 1975. The State Water Resources Control Board has included salinity control in the Colorado River among its top priority items.

Colorado

NPDES Permits: The NPDES permit program was delegated to the State of Colorado by the EPA in May, 1978. The Water Quality Control Division ("WQCD") of the Colorado Department of Public Health and Environment administers the NPDES program in Colorado. The Water Quality Control Commission ("WQCC") has adopted regulations for implementation of the Colorado River Salinity Standards which reflect the four Forum policies adopted to date. Permits issued for discharges tributary to the Colorado River require compliance with these regulations and monitoring of discharge salt load. Consistent with the Forum's policies, industrial and municipal permittees who cannot meet the no salt discharge objective of those policies, and do not otherwise qualify for a waiver of the no salt objective, are required to conduct studies to demonstrate that meeting these standards is not practicable.

Currently (as of September 30, 1998), there are 210 NPDES permits in the Colorado River Basin portion of the state, of which 123 are domestic or municipal and 87 are industrial facilities. Of this total, there are 3 major industrial permits and 20 major municipal permits.

Water Quality Management Planning: Pursuant to Section 319 of the Clean Water Act ("CWA", as amended) Colorado developed a "Nonpoint Source Assessment Report" ("NSAR") which identified stream segments impacted by nonpoint source pollution and categories of nonpoint source pollutants which added significant pollution to those stream segments. The report recognized the impacts caused by salinity from nonpoint sources on several stream segments and principally attributed the elevated salinity levels in those segments to agricultural activities (i.e. irrigation and soil erosion due to grazing). It further recognized the significance of the salinity control efforts which have been made pursuant to the Colorado River Basin Salinity Control Act. The assessment report also recognized the need for development of best management practices (BMPs) to control nonpoint source pollution, and a handbook of BMPs has been completed. This information is currently being updated, and is now included in the biennial Section 305(b) (of the CWA) report, "Status of Water Quality in Colorado".

The "Colorado Nonpoint Source Management Program", completed by the State and approved by EPA, is intended to provide an implementation strategy for the future treatment of water quality problems identified in the NSAR. The program sets forth the roles and responsibilities of the various parties responsible for implementing the nonpoint source program in Colorado. The program includes: a priority system for reviewing, ranking and recommending nonpoint source

control projects for funding and BMP's that can be utilized to achieve water quality objectives. The program is currently being updated and will also include EPA's "9-Key Elements".

In the Colorado River Basin of Colorado there are four water quality planning regions. Region 9 covers primarily the San Juan Basin portion of Colorado. Salinity control projects in this area include McElmo Creek and portions of the Dolores Project. The Region 10 plan covers primarily the Gunnison and Dolores River Basins. Salinity control projects in this region include the Lower Gunnison and Paradox Valley units. Region 11 includes the Colorado main stem below Dotsero, and the lower reaches of the White and Yampa Rivers. Salinity control projects in this region are Grand Valley, Glenwood-Dotsero and Meeker Dome. Region 12 is comprised primarily of the high mountain headwaters of the Colorado River and produces little salt loading to the river system. The Water Quality Management Plan for this region has not been updated recently. Regional plans direct salinity control efforts towards control of point sources and local control of nonpoint sources in the form of urban runoff restrictions and contain lists of stream classifications and the NPDES permits within each area.

Opportunities for salinity control have been identified in the management plans for all areas of the Colorado River Basin within Colorado. Critical salt yielding areas have been assessed by the USDA, the Colorado Soil Conservation Board, the local soil conservation districts, and in some cases the US Bureau of Land Management. Most recently the USDA's Natural Resources Conservation Service and the WQCD's staff cooperated in preparing a Unified Watershed Assessment which identified watersheds to be targeted for water quality improvement projects. All of the high salinity load contributing watersheds in western Colorado were assigned the highest priority for the use of additional funds made available to the Nonpoint Source Program established by Section 319 of the CWA.

Other Activities: Colorado has continued its support of the basinwide approach to salinity control through its participation in the Colorado River Basin Salinity Control Forum and active promotion of participation in salinity control projects by local water users. The Colorado General Assembly recently authorized a $1 million loan program administered by the Colorado Water Conservation Board to help finance cost-sharing obligations of local participants.

The Colorado Soil Conservation Board (CSCB), with support from other state agencies, is continuing its work with the NRCS, Farm Service Agency and local soil conservation districts to direct, as appropriate, available federal soil conservation funding programs towards improvement of on-farm irrigation practices. The salinity control benefits of improved practices are one of the reasons for this effort. In 1997 the CSCB agreed to manage a program for the Salinity Control Forum that provides for the cost-sharing required for salinity control provided through the USDA EQIP program.

Selenium, an element essential in small amounts, and yet toxic to aquatic and bird life in slightly larger amounts, is believed to be liberated by the same processes which load salt to the River system. The National Irrigation Water Quality Program ("NIWQP"), an Interior program composed of the USBR, USFWS and USGS has been charged with identifying and reducing selenium loading produced as a result of the operation of Federal projects. NIWQP will provide 44% of the total costs

of a demonstration project, thereby "buying down" the cost of the salinity control features under a proposal submitted by the Uncompaghre Valley Water Users Association and accepted by USBR's new competitive salinity control program. The project, located in the Montrose Arroyo basin, will place over seven (7) miles of irrigation ditch in pipe, and through extensive monitoring will allow an analysis of how much selenium can be reduced in conjunction with a conventional salinity control project. The Colorado Division of Wildlife is assisting in implementation of the Habitat Restoration Plan which is a required element of the demonstration project. Additionally, the Colorado NPS Council has funded a 319 project to begin a process to target selenium loading in the Gunnison and Uncompaghre Valleys, with the goal of reducing this loading in the future.

Nevada

NPDES Permits: EPA has delegated the Nevada Division of Environmental Protection (NDEP) authority to issue NPDES Permits. The industrial companies located at the Basic Management, Inc. (BMI) complex have eliminated industrial wastewater discharges to the Las Vegas Wash. The companies now pipe wastewater to lined evaporation ponds. Two of the companies have been issued permits which allow discharge of cooling water to Las Vegas Wash with a limit of no more than 75 mg/L TDS greater than the water supply. Another company has been issued a permit which allows discharge of surface stormwater runoff.

In the past, the Nevada Power Company discharged brackish cooling water from both the Clark and Sunrise Power Plants into the Las Vegas Wash. Permits now prohibit such discharges and the Company treats and recycles water for further cooling before final disposition into lined evaporation ponds. The new recycling process has reduced the cooling water requirement by about 75 percent.

The City of Las Vegas (CLV) and the Clark County Sanitation District (CCSD) were issued new discharge permits in January 1992. The City and County permits allow a flow of up to 66 and 90 million gallons per day (MGD), respectively. Permit applications are pending for discharge of 91 MGD for CLV and 110 MGD for CCSD. Changes from the previous permits include Waste Load Allocations (WLA) for total phosphorus and total ammonia, whole effluent toxicity testing, chlorine residual limits, and an ambient monitoring program in Las Vegas Wash and Las Vegas Bay. The WLA for total phosphorus will apply from March through October and ammonia from April through September. The WLA does not apply to other periods of the year.

The City of Henderson was issued an NPDES permit in December 1997 to discharge up to 13 MGD to the Las Vegas Wash. In April 1998, the City submitted a new NPDES application which would allow discharge of up to 30 MGD to the Las Vegas Wash. The permit application is currently under review and is expected to be approved by NDEP in 1999. The existing and proposed NPDES permits recognize that the WLA is based upon each Las Vegas Valley discharger's proportionate share of flow as approved by NDEP and agreed to by each Las Vegas Valley discharger. Henderson will continue to use its rapid infiltration basins and percolation ponds as a disposal option as currently allowed by NDEP. Additionally, Henderson has an aggressive reclaimed water program which uses reclaimed water on golf courses and roadway medians.

The CCSD makes direct discharge of part of Laughlin's wastewater effluent into the Colorado River, and reuses the remainder on the local golf course. The CCSD estimates that by the year 2000, Laughlin, a rapidly growing resort area located adjacent to the Colorado River, will ultimately have 7,000 acre-feet per year of treated effluent available, of which 2,000 acre-feet per year will be reused, with the remaining 5,000 acre-feet per year being returned to the Colorado River for credit. An NPDES permit has been issued. The quality of the waters affected by this permit will be closely monitored and all necessary programs to protect water quality standards will be implemented.

Nevada is continuing to apply the policies adopted by the Forum.

Water Quality Management Planning: After passage of Senate bill 468 by the Nevada State Legislature in May 1975, area-wide water quality management planning duties and powers were vested to certain counties. The Clark County Board of Commissioners (BCC) was designated the Area-Wide Water Quality Management Planning organization within Clark County. The initial 208 Water Quality Management Plan (208 Plan) was adopted by the BCC in 1978 and was approved by the EPA.

In 1997, the BCC adopted the Las Vegas Valley 208 Water Quality Management Plan Amendment. The Las Vegas Valley 208 amendment included updates to planning area boundaries, wastewater flow projections, reclaimed water demands, nonpoint source management, Las Vegas Wash Wetlands planning, integrated planning coordination, and overall water quality planning.

The main purpose of this 208 Plan Amendment is to:

- Revise the 1990 208 Plan Amendment
- Include effects of sustained regional growth and development
- Revise stormwater permitting to a more inclusive nonpoint section
- Provide water quality planning to a horizon year of 2020

Updated aspects of the plan include the planning area boundaries, wastewater flow projections, reclaimed water demands, nonpoint source management, Las Vegas Wash Wetlands planning, integrated planning coordination, and overall water quality planning.

Clark County is currently amending the rural county 208 Water Quality Management Plan. The amendment area is located in the northeast area of the county including the communities of Bunkerville, Logandale, Overton, Moapa and Moapa Valley, and the City of Mesquite. Two rivers are located in the area, the Muddy and Virgin Rivers. The Virgin River is currently listed on the State's 303d list. Both rivers have aquatic endangered species and drain into Lake Mead.

On December 17, 1998, the Southern Nevada Strategic Planning Authority (Authority) adopted a strategic plan for southern Nevada. The Authority was created in the 1998 State of Nevada legislative session. The Authority's task is to develop objectives and strategies to address growth related issues such as wastewater and water quality. The plan will be passed on to the 1999 legislative session.

Expansions of the CCSD and CLV wastewater treatment facilities are underway in accordance with approved 201 facilities plans. Industrial pre-treatment permits are being required by the CCSD for reverse osmosis treatment of shallow groundwater and on-site treated gray water to be used by the Mirage/Treasure Island development in its landscaping and decorative water features. This represents a new beneficial use of shallow saline ground water which is pumped for dewatering around building foundations. Local government entities within urban Clark County are also participants in the NPDES Stormwater Quality Management Committee to identify and implement measures to meet State stormwater permitting requirements. Future 208 amendments are expected to address gray water issues and shallow ground water issues, to update population projections, and to incorporate BMPs identified in the stormwater permit for the Las Vegas area entities.

In June 1998, the State Environmental Commission adopted revised water quality standards for the Las Vegas Wash and Lake Mead. The revisions were based on data collected from 1991 through 1996 and include changes to total dissolved solids (TDS) requirements to maintain higher quality (RMHQs). RMHQs are established when the existing water quality is better than the criteria necessary to protect the beneficial uses. For the upper Las Vegas Wash, the TDS RMHQ was lowered from 2,300 mg/l to 1,900 mg/l; and for the lower Las Vegas Wash, the TDS RMHQ was lowered from 2,600 mg/l to 2,400 mg/l. The lower TDS concentrations seen in the Las Vegas Wash in recent years most likely results from dilution of the saline groundwater which discharges to the Wash by the increasing, but relatively low TDS flows discharged from the wastewater treatment plants.

Facilities Plans: The City of Henderson recently completed a Facility Plan which defines various stages of wastewater treatment expansion to address growth and potential changes in regulatory requirements. The existing Water Reclamation Facility was upgraded to 20 MGD in 1998 and will be expanded to 30 MGD by 2002. The Facility will have the capability of discharging to the Las Vegas Wash on a year-round basis. However, the City will continue to encourage the use of reclaimed water and will continue to use the existing rapid infiltration basins as a means of disposal.

The CCSD is constructing a project which will increase the District's advanced secondary treatment capacity to 65.6 MGD. This should be sufficient capacity for projected wastewater flows through the year 2000. The advanced secondary treatment plant will provide nitrification to reduce ammonia to required levels. Effluent from the advanced secondary treatment plant will be pumped to the Advanced Waste Treatment (AWT) plant for additional treatment which includes the removal of phosphorus.

The capacity of the City of Las Vegas' treatment plant is 66 MGD. The treatment plant provides secondary treatment, phosphorus removal, and nitrification to remove ammonia. The treatment facility treats the flows of both the Cities of Las Vegas and North Las Vegas. Permit applications are pending for expansion to 91 MGD.

Other Activities: A program has been developed by CCSD, CLV, and CNLV to coordinate, investigate, and encourage the implementation of management practices resulting in reduction of

wastewater salinity. The principal emphasis of this program will be directed toward salinity control to meet the requirements of the NPDES permits issued to Clark County, the City of Las Vegas, and Henderson.

New Mexico

NPDES Permits: Authority for issuing permits has not been delegated to the state of New Mexico. Currently, the program is being administered by EPA, Region VI, except for facilities located on the Navajo Indian Reservation, which are administered by Region IX. EPA is following Forum policy in the administration of the permit program. All new or renewed discharge permits contain language requiring the permittee to adhere to Forum policy regarding salt discharges.

In the Colorado River Basin within the state, the following permits have been issued:

a. Industrial permits: electric power generation (3), coal mines (8), uranium mines (3), sand and gravel operations (3), small domestic sewage treatment plants (3), small process water treatment facility (1), and a drinking water treatment plant (1).

b. Municipal discharge permits: major sewage treatment plants (3) minor sewage treatment plants (2), and federal/Indian wastewater facilities (11).

Water Quality Management Planning: Work elements of the State of New Mexico Water Quality Management Plan (NMWQMP) and the New Mexico Nonpoint Source Management Plan (NPSMP) applicable to the Colorado River Basin are stream bottom deposits and sediment control from many different sources, including hydromodification, silviculture and irrigated agriculture. The New Mexico Water Quality Control Commission is required to approve and adopt the NMWQMP's for New Mexico. The initial Plan was adopted in two parts in October 1978 and May 1979. The most recent update to the NMWQMP was adopted in 1991. The most recent update of the MPSMP was in August 1994, and as required, will be updated during calendar year 1999. Both plans recognize the importance of working cooperatively with the Colorado River Basin Salinity Control Forum.

The NMWQMP and the NPSMP cover the entire state except for that portion of the Navajo Reservation lying therein. Planning within the reservation is the responsibility of the Navajo Tribe. Much of the Colorado River Basin in New Mexico is within the reservation.

Both plans encourage the voluntary use of BMPs to control or reduce nonpoint source pollution. The NMWQMP currently designates the San Juan River Basin in New Mexico as one of the four priority basins for implementation of sediment control. Water quality segments 2405 and 2401 of the San Juan River are both listed on the State's 1998-2000 Section 303(d) list of impaired waters for stream bottom deposits, and for turbidity and fecal coliform respectively. Segments 2403 and 2404 of the Animas River are currently listed on the Section 303(d) list for stream bottom deposits. The San Juan River Basin is scheduled for an intensive water quality survey and possible

Total Maximum Daily Load development by December 31, 2004 under a federal court order Consent decree stemming from the case of Forest Guardians and Southwest Environmental Center v. Carol Browner, Administrator, U.S. Environmental Protection Agency, Civil Action No. 96-0826 LH/LHF. The San Juan Basin and its tributaries are also a Category 1 watershed under the Clean Water Action Plan, Unified Watershed Assessment (UWA). The UWA prioritizes the use of certain 319(h) monies and State Revolving Load Fund monies (SRF) toward the implementation of Nonpoint Source Management Projects in the various priority watersheds.

The NMWQMP includes designated management agencies responsible for implementation of the nonpoint source control programs set forth therein. The agencies designated for portions of New Mexico lying within the Colorado River Basin are:

- New Mexico Forestry Division for silviculture;
- New Mexico State Highway Department, New Mexico State Park and Recreation Division, and Jicarilla Apache Tribe for rural road construction and maintenance;
- New Mexico State Land Office and U.S. Bureau of Land Management for sediment control;
- U.S. Forest Service for sediment control, rural road construction and maintenance, and silviculture, and;
- U.S. Bureau of Indian Affairs for sediment control, rural road construction and maintenance, silviculture, and irrigated agriculture.

Additional management strategies used to control nonpoint source pollution were developed by the State under Section 319 of the 1987 Amendment to the federal Clean Water Act. Section 319 required each state to develop an assessment of its nonpoint source impacted waters and a management plan for controlling pollution from these sources (NPSMP). Both the assessment and the management program have been approved by EPA. The goal of the NPSMP is to develop and implement a program which will reduce human-induced pollutants from nonpoint sources entering surface and ground waters. The New Mexico Nonpoint Source Pollution Management Program has been in effect for nine years. The State is making steady progress in identifying, controlling and abating existing nonpoint source pollution problems, and in preventing additional nonpoint source concerns. Several State and federal land management agencies listed in the NMWQMP, such as the U.S. Forest Service, BLM, and the State Land Office, are participating, along with many other federal, State and Local agencies, in nonpoint source activities.

Other Activities: The State of New Mexico, through the Colorado River Basin Salinity Control Advisory Council and the New Mexico Water Quality Control Commission, supports the Colorado River Basin Salinity Control Program, and recently passed a motion in January, 1999, to support projects using State Revolving Loan Funds (Sec. 201 of the Clean Water Act) (SRF) and other funds. State actions include: (l) support of federal legislation including appropriations to implement the program, (2) inclusion of salinity control measures in the Section 208 plans, (3) dissemination of information on salinity sources and control measures to the water users and the public in the Colorado River Basin area of the state, (4) consultation with industries on potential salinity reduction measures, (5) implementation of Forum policy through existing legal and institutional mechanisms, e.g. NPDES permits, (6) providing matching funds to support the USGS

water quality data collection program in the Colorado River Basin portion of the state, and (7) maintaining a continuous water quality planning program whereby new or additional salinity control measures can be addressed. A decrease in funding for item (6) above has caused a reduction in this program since 1986.

Utah

NPDES Permits: The Utah Division of Water Quality administers the discharge permit program. The State has the responsibility for issuance and compliance for all new permits and permit renewal applications received since July 7, 1987.

Forty-five discharge permits are in effect for industrial facilities in the Utah portion of the Colorado River Basin. Most of the permits are for facilities with no discharge, or for discharge of intercepted ground water from mining operations in accordance with Forum policy. Additional storm water permits have been issued for construction activities.

There are 16 active permits for municipal treatment facilities in the Colorado River Basin of Utah.

Water Quality Management Planning: Water quality management plans pursuant to section 208 of the Clean Water Act for the Uinta Basin, Southeastern Utah, and Wayne County certified by the State and approved by the EPA are in place, and portions of these plans have been implemented.

Other Activities: Utah's Nonpoint Source Management Plan was approved by EPA in December 1989. The plan contains Utah's strategy for the control of nonpoint source pollution in the state. A major element in the plan is the need to define rangeland areas in the Colorado River drainage which are yielding sediment and salinity to the system. In a joint effort, the Utah Department of Agriculture, the Utah Department of Health, the Utah Division of Water Resources, Reclamation, BLM, SCS and the USGS completed the task of delineating these areas in 1992. This project identified watershed projects which may be implemented for salinity control on a cost-effective basis. Utah has relied on USDA EQIP (and previously ACP) funds and Reclamation salinity control funding to implement salinity control projects in the Colorado River Basin.

Major new construction of irrigation improvements for salinity control has started in the Price River and San Rafael River Drainages. The principle funding source for the off-farm conveyance and distribution systems of these projects is Reclamation's Basinwide Program. The on-farm projects use EQIP funding along with local cost share. The local cost share for both programs is generally a combination of landowner monies and state program monies. Utah operates a low interest loan program which provides funding for soil and water conservation and water quality improvement practices for farms. Utah has committed a substantial amount of funding through this program to irrigation improvement projects which provide salinity reduction from on-farm sources. This program operates under the guidance of the Soil Conservation Commission and local soil conservation districts. In addition, low interest loans are available to irrigation companies from the

Board of Water Resources for the improvement of irrigation transmission and delivery systems. These improvements increase efficiency and decrease seepage losses, thereby contributing less deep percolation water for salt loading to the Colorado River system.

Wyoming

NPDES Permits: The Wyoming Department of Environmental Quality (DEQ), Water Quality Division, administers the NPDES Program within the boundaries of the State of Wyoming. The Forum's "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program" is used and followed to evaluate industrial and municipal discharges. A total of fifty-four active NPDES permits are associated with facilities in the Wyoming portion of the Colorado River Basin.

There are currently thirty-five active NPDES permits issued to industrial facilities located in the Wyoming portion of the Colorado River Basin. The primary industrial source of salinity in the Green River Basin introduced through a point-source discharge is Pacificorp's Naughton Plant which discharges approximately ten tons of salt per day into a tributary of the Green River. The permit for this facility was issued on the basis that it was not "practicable" to implement the Forum policy of no discharge of salt from industrial sources, following a decision based upon a comparison of the costs of removing salt and downstream benefits associated with eliminating the discharge. The current permit, due to expire on July 31, 2003, requires a benefit/cost analysis to be conducted by July 31, 2001.

Of the remaining industrial discharges, two appear to be exceeding the Forum's policy limitations on TDS discharges. These are FMC Coke Plant, and the Pittsburg & Midway Coal Company's Skull Point Mine. Estimated average daily salt loadings from these facilities are 1.16 and 1.47 tons/day. However, data to support these estimates are incomplete. Therefore, discharges from these facilities will be evaluated in greater detail to determine the accuracy of these estimates, and, if necessary, permits will be modified such that policy compliance is achieved. There are no identified exceedences associated with the remaining industrial facilities. Permits for twelve of the facilities do not currently require TDS monitoring. These permits will be modified to incorporate monitoring necessary to assess compliance with Forum policy as the permits are renewed.

Nineteen permits are associated with domestic wastewater effluents. These permitted facilities serve a population of approximately 44,000. Of this total population, 33,000 are in Rock Springs and Green River. The wastewater treatment plant discharges at Rock Springs and Kemmerer/Diamondville are out of compliance with the policy in that their incremental increases are 450 mg/L and 468 mg/L respectively. The total populations associated with these towns are 20,000 in Rock Springs, and 3,900 in Kemmerer/Diamondville. The average flow volumes contributed to the system are 2.32 and 0.4 MGD respectively. At the next permit renewal, the DEQ will work with these municipalities to determine the feasibility of reducing TDS in conformance with Forum policies.

Permits for eleven municipal facilities are currently not in compliance with the policy in that the permits do not require monitoring for TDS. At the time of each permit renewal, DEQ will re-assess whether monitoring is necessary to assess compliance with Forum policy. TDS monitoring will be incorporated into the renewed permits if it is determined that there is a reasonable potential to exceed 1 ton/day or 350 tons/year of salt discharge.

Water Quality Management Planning: The Water Quality Management Planning and Nonpoint Source Implementation Programs in Wyoming are under the direction of the Water Quality Division of the Department of Environmental Quality. The Clean Water Report for Southwestern Wyoming addressed water quality in Lincoln, Uinta and Sweetwater Counties. This report was adopted at the local level, certified by the Governor, and conditionally approved by the EPA on October 9, 1980. The Governor's certification recognized a salinity control program for the Green River Basin as a major water quality priority. The State strongly supports the ongoing USDA-initiated salinity control effort on the Big Sandy River Unit.

The Statewide Water Quality Management Plan establishes an institutional framework under which planning and implementation activities can proceed in Wyoming. Implementation of most aspects of the program depends on the availability of funds and the acceptance of responsibilities by the designated management agencies. The Wyoming Statewide Water Quality Management Plan is amended regularly through adoption of the triennial review and its supplemental report.

The Wyoming Department of Environmental Quality, Water Quality Division, reorganized separate point and nonpoint source sections into a single watershed protection program. A strategy is being developed to assess and coordinate voluntary nonpoint source pollution control efforts more closely with point source permitting activities and groundwater protection initiatives. A five-year statewide monitoring plan has been established to assess water quality on a watershed-by-watershed basis. Watersheds in the Little Snake River Basin and most of the Green River Basin were sampled in 1998, and the remainder of the Green River is scheduled for assessment in year 2000.

The Wyoming 303(d) list of waters requiring the development of Total Maximum Daily Load (TMDL) qualification was published and approved by EPA in April, 1998. A total of 17 stream segments in the Colorado River Basin appear on the list. Only two streams in the Colorado River drainage were listed with credible impairments and neither were salinity related. Exceedences of the pH standard were found on the Hams Fork River near Kemmerer, and Haggerty Creek in the Little Snake Basin was listed for impairments associated with past hard rock mining activities. Both are slated for TMDL development in the next few years. The exact source of the pH problem on the Hams Fork has not yet been identified and a metals remediation plan on Haggerty Creek is currently being developed by the DEQ Abandoned Mine Lands Program.

New wasteload allocations were calculated upon renewal of NPDES discharge permits for the wastewater treatment plant discharges in Kemmerer and Mountain View in 1998. A new allocation will be calculated for the Town of Dixon when its NPDES permit is renewed in the year 2000.

The remaining 12 stream segments are waterbodies for which there is data indicating trends away from supporting designated uses. Four of these are located in the Green River Basin, and 8 in the Little Snake. All are listed for problems associated with silt and sediment, and though salinity is not identified as a problem, efforts to control sediment should also have a positive effect on salt loading. These 12 segments have a relatively low priority for TMDL development because of the existence of ongoing nonpoint source control projects associated with each.

In addition to the 303(d) listed streams, 27 other stream segments have been identified as having potential water quality impairments, but there are insufficient data to make a conclusive determination. These streams are all scheduled for further monitoring and assessment, and a final determination should be made on each by the year 2001.

The Wyoming Nonpoint Source Management Plan was initially approved by EPA in September 1989. The Plan calls for a cooperative, voluntary approach in the implementation of BMPs targeted at water quality improvements. As with the Statewide Water Quality Management Plan, implementation hinges upon acceptance of responsibilities by designated management agencies, and upon the availability of funding under Section 319. The State began a revision of the Nonpoint Source Management Plan in 1998 to conform to new EPA guidelines. The revised plan is expected to be completed and adopted prior to the FY 2000 319 grant allocations.

Wyoming began the triennial review of its surface water standards in 1998. A draft set of regulations was published in August 1998 containing major revisions to the standards program. The most important amendments involve changes to the stream classification system, updated numeric toxics criteria, and new antidegradation and mixing zone implementation procedures. Wyoming continues to support the salinity standards established by the Colorado River Basin Salinity Control Forum, and incorporates the Forum's numeric standards and implementation plans into its overall program. There are no changes proposed for salinity measures in the draft regulations.

Other Activities: There continues to be considerable interest in implementing a second U.S. Department of Agriculture salinity control project in the Black's Fork Basin in Wyoming. Landowners within the Bridger Valley Conservation District have closely followed the success of Wyoming's one ongoing salinity control project, the Big Sandy River Unit. A 1991 reconnaissance-level study by the Wyoming State Office of the Natural Resources Conservation Service indicated the considerable potential to significantly reduce salt loading into the Black's Fork, Henry's Fork and Ham's Fork tributaries of the Green River, and estimated the cost-effectiveness of controlling such salt-loading to be more expensive than the Big Sandy Unit, but at a per-ton cost which would be competitive with other salinity control projects now being implemented. The State of Wyoming is supportive of the initiation of a second on-farm salinity control project in Wyoming, and is continuing to look for ways to get a Black's Fork area project started.

CHAPTER 5 - MEANS OF MAKING PLAN OPERATIONAL

Overview

The Forum has as its objective the overall coordination and implementation of projects, and the continuing review of salinity changes and program effectiveness. At least every three years, the Forum considers existing and projected water depletions and salt concentrations and, as needed and feasible, recommends revisions in the schedule for implementing salinity control measures and/or modifications of the numeric criteria. The Review includes examination of both federal and non-federal programs. The Review is transmitted to the EPA and state water resources and pollution control agencies, and is made available to others interested in the Colorado River Basin Salinity Control Program. A key conclusion of this Review was set forth in Chapter 3 wherein the Basin states find that the present numeric criteria are appropriate and no change in them is recommended at this time.

The means of making the plan of implementation operational consists of having coordinated planning for additional salt removal and seeking the necessary appropriations for carrying out those goals. Accomplishment of the Salinity Control Program is dependent upon funding of the efforts included in the plan of implementation. This is dependent upon agency budgetary requests being made, Congressional appropriations being secured, and irrigation modifications and other salt loading reduction practices being put into place and then kept operational. The amount of funds brought to parallel the federal program by the Basin states' cost sharing is dependent on the federal appropriations.

Program Development and Implementation

Several significant legislative changes concerning the Salinity Control Program have occurred since the adoption of the 1996 Review by the Colorado River Basin Salinity Control Forum. These changes have affected both Reclamation and the Department of Agriculture's (USDA) salinity control programs and have given direction to the Bureau of Land Management (BLM). However, the Salinity Control Program is not static; it is dynamic and, hence, the program needs to be constantly evaluated, with changes being identified and implemented, if needed.

The Basinwide Program authorized in 1995 for Reclamation appears to be proceeding in a very timely way to implement cost-effective measures. However, when the legislation was enacted, a $75 Million ceiling was imposed by the Congress with the thought that the Basinwide Program would be reviewed after a period of time to see if it was as successful as had been anticipated. It was expected that, with a successful review of the newly implemented program, Congress would increase the ceiling authorized for expenditures. The funds that have been committed or are anticipated to be committed in the near-term point to the need for the Congress to act in the near future to raise the

ceiling. Hence, legislation should be introduced and supported so that there will not be a break in the funding provided to Reclamation's Basinwide Program.

USDA's salinity control program, since the passage of FAIRA, has been inadequately funded, and USDA still must demonstrate its ability and willingness to adapt EQIP to the Salinity Control Program and designate an adequate amount of funds from the EQIP funding authority to the Salinity Control Program. If it cannot be demonstrated that the EQIP program can be successfully used by USDA to fulfill its role in the Salinity Control Program, then consideration needs to be given to new legislative authority and new line-item funding by the Congress. It was the FAIRA legislation in 1996 that authorized the Basin states' cost-sharing up-front from the Basin states' funds for both the Reclamation Basinwide Program and USDA's EQIP program. The implementation of this act's cost-sharing provision was perhaps the most significant event with respect to salinity control that occurred since the 1996 Review.

The management philosophy of BLM has not allowed for a direct approach to salinity control by this agency. Identification of an effective plan, as directed by the Congress, has not been forthcoming, according to budget documents. Recent efforts by coordinators within BLM shows some prospect that there will be more attention given to water quality issues, specifically to the Colorado River Basin Salinity Control Program. If BLM is not able to focus on its role in salinity control, then alternative approaches to obtaining the desired collaborative partnership with this federal land management agency will need to be examined.

The USGS streamflow gaging and water quality sampling activities, and the long-standing periods of record at existing stations, are essential to the monitoring and evaluation of salinity control effectiveness. USGS should continue to seek funding under its existing authority for flow gaging and water quality stations in order to provide necessary data for the evaluation of the short-term and long-term effectiveness of the Colorado River Basin Salinity Control Program.

Continuation of the USGS trend to cut funding for its cooperative gaging program will impact the ability to adequately assess the effectiveness of salinity control projects through the loss of data from needed gaging stations.

Education and Public Involvement

Salinity in the Colorado River is a basinwide problem, with implications ranging over the entire 246,000 square mile drainage area. The Basin's immense size highlights the need for effective public education and public involvement programs due to the physical and cultural diversities which exist across the seven states. Implementation of measures to control complex problems such as salinity requires awareness, concern and involvement, along with recognition that a problem many miles away may have direct impacts. The states individually, and together, as the Forum, have and will continue to work with concerned agencies, both state and federal, to increase the public understanding of the salinity problem and its control.

A major thrust of the public education/public involvement effort focuses on educating irrigators as to the sources, impacts and methods of controlling salinity. Improved irrigation practices will reduce the input of salts into the River system. The goal is to encourage desirable changes in water application technology and management practices. The Basin states work within the framework of ongoing efforts by federal, state and local organizations to achieve this goal. Assistance from the Executive Director of the Forum is also provided. The plan formulation phase of Reclamation, USDA, and BLM salinity control efforts provide an excellent opportunity for public education with regard to Colorado River salinity and the means for its control.

Meetings of the Colorado River Basin Salinity Control Forum are open and the public is welcome to attend. All input, whether oral or written, is considered and acted on as appropriate by the Forum. The Forum also provides for public involvement in the water quality standards review process as public meetings are held to receive comments on the salinity standards during each triennial review. As a result of public input, appropriate adjustments to the program are made.

As each of the Basin states proceeds with its own process to review the standards, one or more state-wide public hearings are held. In addition, there is widespread announcement of Forum and state hearings, and copies of the Review and associated state standards are mailed to interested agencies, groups and individuals. Forum members participate with their own state's water quality planning agencies in matters related to salinity and salinity control and will continue to do so as the need arises.

Forum Activities

The Forum meets at least twice a year, or as needed, to discuss the Salinity Control Program, the efforts of the federal agencies and the states, and the need for additional policy and/or action by the Forum. During the last triennial review effort, the Forum met on June 6, 1996 in Breckenridge, Colorado and adopted the preliminary review report for 1996. The Forum then held public meetings during the late summer and, after receiving comments, prepared a supplemental report dated October 1996.

During the current reporting period, the Forum met on October 23, 1996 in Palm Desert, California; May 20, 1997 in Salt Lake City, Utah; October 22, 1997 in Tucson, Arizona; June 17, 1998 in Cheyenne, Wyoming; and October 20, 1998 in Santa Fe, New Mexico. Since the creation of the Forum in November 1973, the Santa Fe meeting was the 59th meeting. The Forum has published a three-volume compilation of all of the minutes of the Forum meetings, one volume from 1973 through 1985, another from 1986 through 1991, and one from 1992 through 1996. The Forum held its 60th meeting on May 27, 1999 in Durango, Colorado, approved this report, and authorized its printing for mailing. It also scheduled public meetings. The Forum plans to make final the adoption of this report at a meeting in the fall of 1999, and perhaps publish a supplemental report.

A Work Group, created by the Forum, holds meetings on a more frequent basis to review technical information which is generated by the federal agencies. Membership on the Work Group is composed of technical representatives from each of the seven Basin states, and the Executive Director of the Forum. Federal agency representatives, however, attend meetings of the Work Group and informally exchange information, ideas and viewpoints. The Work Group coordinates the efforts of the Basin states and reports back to the Forum any actions which the Work Group believes the Forum should consider.

Positions have been taken on many issues, such as the need for appropriation of funds by the Congress for salinity control. Federal agencies have also prepared numerous reports in the three-year period. The Forum has compiled a library of many reports relating to Colorado River salinity. The Work Group and the Forum have had the opportunity to review and comment on these reports in draft form. Notable among the reports done since the last triennial review is a report which is prepared by the Bureau of Reclamation and submitted to Congress every two years. The last of these publications is Quality of Water, Colorado River Basin, Progress Report No. 19, January 1999, U.S. Department of the Interior. In addition, the Forum and the Work Group have, over the last three years, assisted the Colorado River Basin Salinity Control Advisory Council in the preparation of three annual reports.

Financing Salinity Control Activities

By enacting the 1974 Act, Congress recognized the federal role and responsibility for controlling the salinity of the Colorado River, and adopted a cost-sharing formula which provided that 75 percent of the costs of the four originally authorized Department of the Interior salinity control projects under Title II of the Act are non-reimbursable. The remaining 25 percent of the costs are to be repaid from the Upper and Lower Basin funds over a 50-year period without interest. The maximum allocation to the Upper Basin fund is not to exceed 15 percent of the total costs to be repaid from the two funds, with the remainder to be repaid by the Lower Basin fund.

The 1984 amendments to the 1974 Act changed the cost-sharing formula. For the Department of the Interior program, the non-reimbursable portion was reduced to 70 percent, with the remaining 30 percent to come from Upper and Lower Basin funds in the same proportionate share as under the 1974 Act. However, the Upper Basin fund could repay its share over 50 years with interest, and the Lower Basin could reimburse its share of the annual expenditure during the year that costs are incurred.

The USDA salinity control program, as amended in 1996 by FAIRA, requires at least a 25 percent non-federal cost-share for participation. In addition, the legislation allows for the Basin funds to cost-share up to 30 percent. Money is available in the Basin funds for this purpose.

Table 5-1 provides a compilation of the amount of funding provided to Reclamation, USDA, and BLM for the Colorado River Basin Salinity Control Program from Fiscal Year (FY) 1988 to the

present. Funding levels for salinity control activities by BLM continue to be difficult to ascertain due to the fact that the BLM budget does not contain a specific line item for salinity control.

Table 5-1
Summary of Colorado River Basin Salinity Control Program
Funding For the Bureau of Reclamation,
the Department of Agriculture and the Bureau of Land Management
By Federal Fiscal Year Since 1988
(In Dollars)*

Federal Fiscal Year	Bureau of Reclamation	Department of Agriculture	Bureau of Land Management
1988	20,783,000	3,804,000	500,000
1989	16,798,000	5,452,000	500,000
1990	14,185,000	10,341,000	700,000
1991	24,984,000	14,783,000	873,000
1992	34,566,000	14,783,000	873,000
1993	33,817,000	13,783,000	866,000
1994	32,962,000	13,783,000	800,000
1995	12,540,000	4,500,000	800,000
1996	8,205,000	9,561,000	800,000
1997	5,000,000	3,152,000	800,000
1998	7,600,000	3,906,000	800,000
1999	11,500,000	5,132,000	800,000

* Numbers do not include funds provided for the Reclamation and Agriculture programs as up-front cost-sharing from the Basin Funds.

While the USDA program has proven to be a cost-effective component of the Colorado River Basin Salinity Control Program, Administration and Congressional funding support for the program has dramatically declined. Table 5-1 reflects the significant reduction in USDA appropriations between 1994 and 1999. Funding of the USDA program at recent levels jeopardizes the ability of the plan of implementation to be executed in a manner that assures compliance with the numeric criteria.

The 1984 Amendments to the Act (P.L. 98-569) provide that Reclamation is authorized to reimburse the costs of operation and maintenance expenses in excess of those that would have occurred for the thorough and timely operation and maintenance of the unimproved system. Those

amendments also allow the federal government to pay for replacement costs of the facilities and the costs of operation and maintenance of works to replace impacted fish and wildlife values.

The 1995 Amendments to the Act (P.L. 104-20) did not change the cost-sharing and repayment relationships among the states or the federal government, but it did provide additional flexibility to Reclamation if the proposed project has other associated indirect benefits of federal interest, i.e., other water quality or environmental benefits. The cost of this assistance will not be considered a salinity control cost. The 1996 Amendments to the Act (P.L. 104-127) permit up-front cost sharing by the Lower Basin in lieu of repayment over time of federal expenditures.

Revenues accruing to the Lower Basin fund for the Salinity Control Program are derived from a 2½ mill per kilowatt hour levy on California and Nevada purchases of hydro power generation. Revenues accruing to the Upper Basin fund are collected by the Western Area Power Administration. The plan of implementation, as presented earlier in this Review, incorporates a construction schedule which, when completed, will have a total estimated cost of $661 million. Under this Plan, the required salinity reduction can be made throughout the planning period (2015), which includes efforts to eliminate the shortfall as soon as possible but at least within six years, and monies in the Lower Basin fund will be adequate to up-front cost-share or meet its repayment obligation.

Two potential sources of funding to assist salinity control efforts exist under the Clean Water Act. Through FY 1999, Congressional appropriations for Section 319 nonpoint source control funds are nearly $190 Million. Section 319 funds are available for implementing state-adopted EPA-approved nonpoint source management programs. The construction grant program has now essentially been replaced by the State Revolving Fund (SRF) program, which provides low interest loans for pollution control projects. Under Section 603(c)(2), the SRF program can be used to fund implementation of Section 319 projects.

Responsibility for Accomplishing Salinity Control Measures

The plan of implementation recognizes that the Forum, participating federal agencies, and the Basin states each have specific responsibilities for furthering the Salinity Control Program. The elements of the plan of implementation are premised on completion of all of the salinity control measures discussed in Chapter 4 of this report. Specifically, the Forum will continue to provide overall coordination, a continuing review of salinity changes, program effectiveness, and the need to make further program changes and improvements. At least every three years, the Forum considers existing depletions and salt concentrations and, when needed and feasible, recommends revisions in the schedule for implementing salinity control measures and/or modifications of the numeric criteria. This review includes both federal and non-federal programs. The review is then transmitted to the EPA and to state water resources and pollution control agencies and made available to others interested in the Salinity Control Program.

Federal agencies must complete planning efforts and seek authorization and funding for salinity control efforts in accordance with Title II of P.L. 93-320, P.L. 98-569, P.L. 104-20, and P.L. 104-127. The Basin states will continue to encourage the agencies to request funding and to lend their support to obtaining needed funding from the Congress.

Interagency Coordination

Combined Efforts

The Colorado River Basin Salinity Control Program is truly a unique program, and it cannot be successful without the cooperation of a multitude of agencies and governments involved at the local, state and federal levels. First, the program is reliant upon the cooperation of landowners in implementing important and cost-effective salinity control measures. Secondly, the program is dependant upon a multitude of agreements between the seven Colorado River Basin states which have always been accomplished by consensus. Lastly, the program depends upon the cooperation of a number of federal agencies for its success. Public Law 93-320, the Colorado River Basin Salinity Control Act, gives to the Secretary of the Interior responsibilities for implementing salinity control policies adopted for the Colorado River and gives to the Secretary of the Interior many other responsibilities through various sections of the Act.

The Act states: "The Secretary (of the Interior), the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture are directed to cooperate and coordinate their activities effectively to carry out the objectives of this title." The Act further provides that "the Secretary (of the Interior) or the Secretary of Agriculture, as the case may be, shall give preference to those additional units or new self-contained portions of units which reduce salinity of the Colorado River at the least cost per unit of salinity reduction." It is obvious that the federal implementing agencies, that is, Reclamation, BLM, and USDA, must coordinate and cooperate in order to advance, as required by the Act, a cost-effective Salinity Control Program. The lead in fostering this cooperation has been taken by Reclamation. The future success of the program is dependent upon this coordination and cooperation, and the Forum finds that the federal agencies need to be more pro-active in ensuring that their efforts are well understood by all of the involved federal agencies and that the programs being implemented are coordinated to the extent possible.

In addition to the three implementing agencies, there are other federal agencies which are involved in the Salinity Control Program, and cooperation and coordination with these agencies is also most essential. Three agencies are notable; USGS, USF&WS and EPA.

Salinity Control Advisory Council

Cooperation between the federal agencies and the Basin states is also essential, and the program has advanced because of a spirit of good will and a desire to succeed in controlling the salinity of the Colorado River expressed by all of the states and the federal agencies. To ensure that

there would be communication and cooperation, in the Colorado River Basin Salinity Control Act, the Congress created the Colorado River Basin Salinity Control Advisory Council, which is to be composed of no more than three members from each state appointed by the Governors of each of the Colorado River Basin states. The Act directs that the Council shall, among other things, "act as a liaison between both the Secretaries of the Interior and Agriculture and the Administrator of the Environmental Protection Agency and the states in accomplishing the purposes of this title." The Act further directs that the Secretary will make reports to the Advisory Council, and that the Advisory Council will "recommend to both the Secretary and the Administrator of the Environmental Protection Agency appropriate studies to further projects, techniques, or methods for accomplishing the purposes of this title."

U.S. Fish & Wildlife Service (USFWS)

Pursuant to authorities and responsibilities as set forth in the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, and the Migratory Bird Treaty Act, the U.S. Fish and Wildlife Service (USFWS) is an active participant in the Colorado River Basin Salinity Control Program. It is primarily through these legislative authorities that the USFWS coordinates with lead Federal agencies and the Basin states.

The Colorado River Basin supports a biological diversity of fish and wildlife resources, as well as a significant number of unique species and important habitats. The Colorado River system has one of the largest number of threatened and endangered species of fish and wildlife in the United States, while providing important habitats for other biological resources of regional, national, and international significance, including: Neotropical migratory birds, migratory waterfowl (ducks, geese, and shorebirds), rare non-migratory birds such as sage grouse, and many economically important species of big game. In addition, specialized habitats such as wetlands and riparian areas provide nesting/rearing habitat for over 200 species of mammals, birds, and amphibians.

In general, USFWS activities consists of coordination with lead federal agencies in evaluating potential impacts to fish and wildlife resources resulting from proposed salinity control projects. Documentation of USFWS concerns and recommendations are typically in the form of Fish and Wildlife Coordination Act reports, Planning Aid Memorandum, biological opinions, and comments on Draft and Final Environmental Assessments and Environmental Impact Statements. Follow-up coordination with project sponsors to ensure appropriate mitigation is also a major thrust of the USFWS. The Salt Lake City, Utah Field Office (Ecological Services) provides overall program coordination for the USFWS.

USFWS participation in the planning process for salinity control projects is provided through a variety of planning/working/coordinating activities and interactions with Reclamation, BLM, EPA, Natural Resource Conservation Service (NRCS), the Forum, state agencies, Indian tribes, and the general public. General fish and wildlife information, as well as lists of threatened and endangered species and their critical habitats which may occur within salinity control project areas, are provided by the USFWS to the lead federal agencies and other interested parties. Biological opinions rendered under authority of the Endangered Species Act are provided for projects where threatened

and endangered species may be affected. Concerns continue to arise over the anticipated effects of salinity control measures on endangered species and wetlands.

Authorization of new salinity control projects will still require in-depth review by the USFWS to ensure the appropriate protection for endangered species and their critical habitats, as well as the replacement of wetland values potentially lost due to construction and operation of new features. USDA's former authorization to mitigate incidental fish and wildlife values lost (on-farm) on a voluntary basis, has been replaced by EQIP. The USFWS will need to more closely monitor the effectiveness of EQIP in achieving adequate mitigation/compensation, both in proportion to and concurrent with various salinity reducing construction practices. Concepts such as mitigation banking may be explored by all participating state and federal agencies to accomplish satisfactory compensation/mitigation results.

U.S. Geological Survey (USGS)

The USGS's Water Resources Division provides and analyzes hydrologic information to assess the nation's water resources. Programs are developed with cooperation and financial support from state, local and other federal agencies. The programs provide hydrologic and geochemical information for evaluation of surface and ground water systems, as well as for management and policy decisions.

To provide information required by the federal, state and local agencies to address Colorado River water quantity and quality issues, the USGS operates and maintains a network of about 520 stream gaging stations and 140 water quality stations in the Colorado River Basin. Streamflow and water-quality information from these stations provide input to the hydrologic database for Reclamation's Colorado River Simulation System. In addition to collecting hydrologic data, the USGS conducts specific studies on surface water, ground water, and water quality.

Environmental Protection Agency (EPA)

The major EPA programs relating to Colorado River salinity control are: (1) water quality management planning; (2) water quality standards; (3) National Pollutant Discharge Elimination System (NPDES) permits; (4) review of National Environmental Policy Act (NEPA) documents; (5) nonpoint source control under Section 319 of the Water Quality Act of 1987; (6) wetlands protection; and (7) the Underground Injection Control (UIC) Program. For the most part, these programs are either implemented by the states under federal statute, (such as the water quality standards program), or delegated to the states by EPA (such as the NPDES program). EPA maintains oversight responsibilities for the assumed and delegated programs, and has responsibility for reviewing and approving water quality standards, including those for salinity. EPA continues to encourage the Basin states to develop and implement the basinwide and state salinity control strategies.

Section 303 of the Clean Water Act (CWA) requires states to adopt water quality standards pursuant to their own laws which are consistent with the applicable requirements of the CWA. The Colorado River Basin Salinity Control Forum, through its Work Group, has been re-affirming the numeric criteria for salinity and developing a new Basinwide plan of implementation for salinity control for the seven Basin states every three years to satisfy the triennial review requirements of the CWA. Following adoption of the standards by each state, it is the responsibility of the EPA regional administrators to approve or disapprove the standards based on consistency with CWA requirements.

Pursuant to Section 309 of the Clean Air Act, EPA reviews NEPA environmental assessments and environmental impact statements for both salinity and non-salinity control projects of other agencies. Through review of NEPA documents, EPA urges the identification of potential salinity impacts and encourages discussion of mitigation of adverse impacts as required by the Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500-1508). For example, EPA can comment on potential salinity impacts, when appropriate, when reviewing EIS's for grazing and land management, recreational developments, mining, and water development projects. In addition, EPA encourages the development of mitigation measures for adverse impacts to satisfy state and Forum policies for salinity control and through CWA Section 401 certifications for activities subject to federal permitting actions. The Forum policy encouraging the use of water with higher total dissolved solids for industrial purposes is being supported primarily through NEPA review responsibilities.

The basis for wetland protection and mitigation is established in the regulations for compliance with NEPA, Section 404 of the CWA, Executive Order 11990, and USDA policy. However, preserving irrigation-induced wetlands and reducing salt loading to the Colorado River may present conflicts between authorizing legislation and other regulatory programs. A portion of the salt load in the Colorado River system is attributed to seepage and deep percolation from leaking irrigation canals and laterals, and inefficient on-farm irrigation systems and water management. Some of these inefficient irrigation systems and practices are the source of water for many of the wetlands associated with salinity control units. As seepage from irrigation systems is reduced and irrigation efficiencies are improved, some portion of these irrigation-induced wetlands may be impacted or lost. The concept of replacing irrigation-induced wetlands and the need to reduce the salt load in the Colorado River presents difficult choices between environmental values of improved water quality and wetland preservation. Landowners are volunteering to implement wildlife habitat practices, including wetland replacement, as was contemplated by the Salinity Control Act. EPA utilizes NEPA review and other types of coordination with state and federal agencies as the means to participate in wetland assessment, monitoring, replacement, and reporting activities.

Section 319 funds have been appropriated since FY 1990 for the states to implement nonpoint source water pollution control programs. EPA encourages the states to consider salinity control benefits as they make decisions on Section 319 funding for their priority watersheds.

EPA Region VIII administers the Underground Injection Control permit for the Paradox Well salinity control project in Colorado.

of a demonstration project, thereby "buying down" the cost of the salinity control features under a proposal submitted by the Uncompaghre Valley Water Users Association and accepted by USBR's new competitive salinity control program. The project, located in the Montrose Arroyo basin, will place over seven (7) miles of irrigation ditch in pipe, and through extensive monitoring will allow an analysis of how much selenium can be reduced in conjunction with a conventional salinity control project. The Colorado Division of Wildlife is assisting in implementation of the Habitat Restoration Plan which is a required element of the demonstration project. Additionally, the Colorado NPS Council has funded a 319 project to begin a process to target selenium loading in the Gunnison and Uncompaghre Valleys, with the goal of reducing this loading in the future.

Nevada

NPDES Permits: EPA has delegated the Nevada Division of Environmental Protection (NDEP) authority to issue NPDES Permits. The industrial companies located at the Basic Management, Inc. (BMI) complex have eliminated industrial wastewater discharges to the Las Vegas Wash. The companies now pipe wastewater to lined evaporation ponds. Two of the companies have been issued permits which allow discharge of cooling water to Las Vegas Wash with a limit of no more than 75 mg/L TDS greater than the water supply. Another company has been issued a permit which allows discharge of surface stormwater runoff.

In the past, the Nevada Power Company discharged brackish cooling water from both the Clark and Sunrise Power Plants into the Las Vegas Wash. Permits now prohibit such discharges and the Company treats and recycles water for further cooling before final disposition into lined evaporation ponds. The new recycling process has reduced the cooling water requirement by about 75 percent.

The City of Las Vegas (CLV) and the Clark County Sanitation District (CCSD) were issued new discharge permits in January 1992. The City and County permits allow a flow of up to 66 and 90 million gallons per day (MGD), respectively. Permit applications are pending for discharge of 91 MGD for CLV and 110 MGD for CCSD. Changes from the previous permits include Waste Load Allocations (WLA) for total phosphorus and total ammonia, whole effluent toxicity testing, chlorine residual limits, and an ambient monitoring program in Las Vegas Wash and Las Vegas Bay. The WLA for total phosphorus will apply from March through October and ammonia from April through September. The WLA does not apply to other periods of the year.

The City of Henderson was issued an NPDES permit in December 1997 to discharge up to 13 MGD to the Las Vegas Wash. In April 1998, the City submitted a new NPDES application which would allow discharge of up to 30 MGD to the Las Vegas Wash. The permit application is currently under review and is expected to be approved by NDEP in 1999. The existing and proposed NPDES permits recognize that the WLA is based upon each Las Vegas Valley discharger's proportionate share of flow as approved by NDEP and agreed to by each Las Vegas Valley discharger. Henderson will continue to use its rapid infiltration basins and percolation ponds as a disposal option as currently allowed by NDEP. Additionally, Henderson has an aggressive reclaimed water program which uses reclaimed water on golf courses and roadway medians.

The CCSD makes direct discharge of part of Laughlin's wastewater effluent into the Colorado River, and reuses the remainder on the local golf course. The CCSD estimates that by the year 2000, Laughlin, a rapidly growing resort area located adjacent to the Colorado River, will ultimately have 7,000 acre-feet per year of treated effluent available, of which 2,000 acre-feet per year will be reused, with the remaining 5,000 acre-feet per year being returned to the Colorado River for credit. An NPDES permit has been issued. The quality of the waters affected by this permit will be closely monitored and all necessary programs to protect water quality standards will be implemented.

Nevada is continuing to apply the policies adopted by the Forum.

Water Quality Management Planning: After passage of Senate bill 468 by the Nevada State Legislature in May 1975, area-wide water quality management planning duties and powers were vested to certain counties. The Clark County Board of Commissioners (BCC) was designated the Area-Wide Water Quality Management Planning organization within Clark County. The initial 208 Water Quality Management Plan (208 Plan) was adopted by the BCC in 1978 and was approved by the EPA.

In 1997, the BCC adopted the Las Vegas Valley 208 Water Quality Management Plan Amendment. The Las Vegas Valley 208 amendment included updates to planning area boundaries, wastewater flow projections, reclaimed water demands, nonpoint source management, Las Vegas Wash Wetlands planning, integrated planning coordination, and overall water quality planning.

The main purpose of this 208 Plan Amendment is to:

- Revise the 1990 208 Plan Amendment
- Include effects of sustained regional growth and development
- Revise stormwater permitting to a more inclusive nonpoint section
- Provide water quality planning to a horizon year of 2020

Updated aspects of the plan include the planning area boundaries, wastewater flow projections, reclaimed water demands, nonpoint source management, Las Vegas Wash Wetlands planning, integrated planning coordination, and overall water quality planning.

Clark County is currently amending the rural county 208 Water Quality Management Plan. The amendment area is located in the northeast area of the county including the communities of Bunkerville, Logandale, Overton, Moapa and Moapa Valley, and the City of Mesquite. Two rivers are located in the area, the Muddy and Virgin Rivers. The Virgin River is currently listed on the State's 303d list. Both rivers have aquatic endangered species and drain into Lake Mead.

On December 17, 1998, the Southern Nevada Strategic Planning Authority (Authority) adopted a strategic plan for southern Nevada. The Authority was created in the 1998 State of Nevada legislative session. The Authority's task is to develop objectives and strategies to address growth related issues such as wastewater and water quality. The plan will be passed on to the 1999 legislative session.

Expansions of the CCSD and CLV wastewater treatment facilities are underway in accordance with approved 201 facilities plans. Industrial pre-treatment permits are being required by the CCSD for reverse osmosis treatment of shallow groundwater and on-site treated gray water to be used by the Mirage/Treasure Island development in its landscaping and decorative water features. This represents a new beneficial use of shallow saline ground water which is pumped for dewatering around building foundations. Local government entities within urban Clark County are also participants in the NPDES Stormwater Quality Management Committee to identify and implement measures to meet State stormwater permitting requirements. Future 208 amendments are expected to address gray water issues and shallow ground water issues, to update population projections, and to incorporate BMPs identified in the stormwater permit for the Las Vegas area entities.

In June 1998, the State Environmental Commission adopted revised water quality standards for the Las Vegas Wash and Lake Mead. The revisions were based on data collected from 1991 through 1996 and include changes to total dissolved solids (TDS) requirements to maintain higher quality (RMHQs). RMHQs are established when the existing water quality is better than the criteria necessary to protect the beneficial uses. For the upper Las Vegas Wash, the TDS RMHQ was lowered from 2,300 mg/l to 1,900 mg/l; and for the lower Las Vegas Wash, the TDS RMHQ was lowered from 2,600 mg/l to 2,400 mg/l. The lower TDS concentrations seen in the Las Vegas Wash in recent years most likely results from dilution of the saline groundwater which discharges to the Wash by the increasing, but relatively low TDS flows discharged from the wastewater treatment plants.

Facilities Plans: The City of Henderson recently completed a Facility Plan which defines various stages of wastewater treatment expansion to address growth and potential changes in regulatory requirements. The existing Water Reclamation Facility was upgraded to 20 MGD in 1998 and will be expanded to 30 MGD by 2002. The Facility will have the capability of discharging to the Las Vegas Wash on a year-round basis. However, the City will continue to encourage the use of reclaimed water and will continue to use the existing rapid infiltration basins as a means of disposal.

The CCSD is constructing a project which will increase the District's advanced secondary treatment capacity to 65.6 MGD. This should be sufficient capacity for projected wastewater flows through the year 2000. The advanced secondary treatment plant will provide nitrification to reduce ammonia to required levels. Effluent from the advanced secondary treatment plant will be pumped to the Advanced Waste Treatment (AWT) plant for additional treatment which includes the removal of phosphorus.

The capacity of the City of Las Vegas' treatment plant is 66 MGD. The treatment plant provides secondary treatment, phosphorus removal, and nitrification to remove ammonia. The treatment facility treats the flows of both the Cities of Las Vegas and North Las Vegas. Permit applications are pending for expansion to 91 MGD.

Other Activities: A program has been developed by CCSD, CLV, and CNLV to coordinate, investigate, and encourage the implementation of management practices resulting in reduction of

wastewater salinity. The principal emphasis of this program will be directed toward salinity control to meet the requirements of the NPDES permits issued to Clark County, the City of Las Vegas, and Henderson.

New Mexico

NPDES Permits: Authority for issuing permits has not been delegated to the state of New Mexico. Currently, the program is being administered by EPA, Region VI, except for facilities located on the Navajo Indian Reservation, which are administered by Region IX. EPA is following Forum policy in the administration of the permit program. All new or renewed discharge permits contain language requiring the permittee to adhere to Forum policy regarding salt discharges.

In the Colorado River Basin within the state, the following permits have been issued:

a. Industrial permits: electric power generation (3), coal mines (8), uranium mines (3), sand and gravel operations (3), small domestic sewage treatment plants (3), small process water treatment facility (1), and a drinking water treatment plant (1).

b. Municipal discharge permits: major sewage treatment plants (3) minor sewage treatment plants (2), and federal/Indian wastewater facilities (11).

Water Quality Management Planning: Work elements of the State of New Mexico Water Quality Management Plan (NMWQMP) and the New Mexico Nonpoint Source Management Plan (NPSMP) applicable to the Colorado River Basin are stream bottom deposits and sediment control from many different sources, including hydromodification, silviculture and irrigated agriculture. The New Mexico Water Quality Control Commission is required to approve and adopt the NMWQMP's for New Mexico. The initial Plan was adopted in two parts in October 1978 and May 1979. The most recent update to the NMWQMP was adopted in 1991. The most recent update of the MPSMP was in August 1994, and as required, will be updated during calendar year 1999. Both plans recognize the importance of working cooperatively with the Colorado River Basin Salinity Control Forum.

The NMWQMP and the NPSMP cover the entire state except for that portion of the Navajo Reservation lying therein. Planning within the reservation is the responsibility of the Navajo Tribe. Much of the Colorado River Basin in New Mexico is within the reservation.

Both plans encourage the voluntary use of BMPs to control or reduce nonpoint source pollution. The NMWQMP currently designates the San Juan River Basin in New Mexico as one of the four priority basins for implementation of sediment control. Water quality segments 2405 and 2401 of the San Juan River are both listed on the State's 1998-2000 Section 303(d) list of impaired waters for stream bottom deposits, and for turbidity and fecal coliform respectively. Segments 2403 and 2404 of the Animas River are currently listed on the Section 303(d) list for stream bottom deposits. The San Juan River Basin is scheduled for an intensive water quality survey and possible

Total Maximum Daily Load development by December 31, 2004 under a federal court order Consent decree stemming from the case of Forest Guardians and Southwest Environmental Center v. Carol Browner, Administrator, U.S. Environmental Protection Agency, Civil Action No. 96-0826 LH/LHF. The San Juan Basin and its tributaries are also a Category 1 watershed under the Clean Water Action Plan, Unified Watershed Assessment (UWA). The UWA prioritizes the use of certain 319(h) monies and State Revolving Load Fund monies (SRF) toward the implementation of Nonpoint Source Management Projects in the various priority watersheds.

The NMWQMP includes designated management agencies responsible for implementation of the nonpoint source control programs set forth therein. The agencies designated for portions of New Mexico lying within the Colorado River Basin are:

- New Mexico Forestry Division for silviculture;
- New Mexico State Highway Department, New Mexico State Park and Recreation Division, and Jicarilla Apache Tribe for rural road construction and maintenance;
- New Mexico State Land Office and U.S. Bureau of Land Management for sediment control;
- U.S. Forest Service for sediment control, rural road construction and maintenance, and silviculture, and;
- U.S. Bureau of Indian Affairs for sediment control, rural road construction and maintenance, silviculture, and irrigated agriculture.

Additional management strategies used to control nonpoint source pollution were developed by the State under Section 319 of the 1987 Amendment to the federal Clean Water Act. Section 319 required each state to develop an assessment of its nonpoint source impacted waters and a management plan for controlling pollution from these sources (NPSMP). Both the assessment and the management program have been approved by EPA. The goal of the NPSMP is to develop and implement a program which will reduce human-induced pollutants from nonpoint sources entering surface and ground waters. The New Mexico Nonpoint Source Pollution Management Program has been in effect for nine years. The State is making steady progress in identifying, controlling and abating existing nonpoint source pollution problems, and in preventing additional nonpoint source concerns. Several State and federal land management agencies listed in the NMWQMP, such as the U.S. Forest Service, BLM, and the State Land Office, are participating, along with many other federal, State and Local agencies, in nonpoint source activities.

Other Activities: The State of New Mexico, through the Colorado River Basin Salinity Control Advisory Council and the New Mexico Water Quality Control Commission, supports the Colorado River Basin Salinity Control Program, and recently passed a motion in January, 1999, to support projects using State Revolving Loan Funds (Sec. 201 of the Clean Water Act) (SRF) and other funds. State actions include: (1) support of federal legislation including appropriations to implement the program, (2) inclusion of salinity control measures in the Section 208 plans, (3) dissemination of information on salinity sources and control measures to the water users and the public in the Colorado River Basin area of the state, (4) consultation with industries on potential salinity reduction measures, (5) implementation of Forum policy through existing legal and institutional mechanisms, e.g. NPDES permits, (6) providing matching funds to support the USGS

water quality data collection program in the Colorado River Basin portion of the state, and (7) maintaining a continuous water quality planning program whereby new or additional salinity control measures can be addressed. A decrease in funding for item (6) above has caused a reduction in this program since 1986.

Utah

NPDES Permits: The Utah Division of Water Quality administers the discharge permit program. The State has the responsibility for issuance and compliance for all new permits and permit renewal applications received since July 7, 1987.

Forty-five discharge permits are in effect for industrial facilities in the Utah portion of the Colorado River Basin. Most of the permits are for facilities with no discharge, or for discharge of intercepted ground water from mining operations in accordance with Forum policy. Additional storm water permits have been issued for construction activities.

There are 16 active permits for municipal treatment facilities in the Colorado River Basin of Utah.

Water Quality Management Planning: Water quality management plans pursuant to section 208 of the Clean Water Act for the Uinta Basin, Southeastern Utah, and Wayne County certified by the State and approved by the EPA are in place, and portions of these plans have been implemented.

Other Activities: Utah's Nonpoint Source Management Plan was approved by EPA in December 1989. The plan contains Utah's strategy for the control of nonpoint source pollution in the state. A major element in the plan is the need to define rangeland areas in the Colorado River drainage which are yielding sediment and salinity to the system. In a joint effort, the Utah Department of Agriculture, the Utah Department of Health, the Utah Division of Water Resources, Reclamation, BLM, SCS and the USGS completed the task of delineating these areas in 1992. This project identified watershed projects which may be implemented for salinity control on a cost-effective basis. Utah has relied on USDA EQIP (and previously ACP) funds and Reclamation salinity control funding to implement salinity control projects in the Colorado River Basin.

Major new construction of irrigation improvements for salinity control has started in the Price River and San Rafael River Drainages. The principle funding source for the off-farm conveyance and distribution systems of these projects is Reclamation's Basinwide Program. The on-farm projects use EQIP funding along with local cost share. The local cost share for both programs is generally a combination of landowner monies and state program monies. Utah operates a low interest loan program which provides funding for soil and water conservation and water quality improvement practices for farms. Utah has committed a substantial amount of funding through this program to irrigation improvement projects which provide salinity reduction from on-farm sources. This program operates under the guidance of the Soil Conservation Commission and local soil conservation districts. In addition, low interest loans are available to irrigation companies from the

Board of Water Resources for the improvement of irrigation transmission and delivery systems. These improvements increase efficiency and decrease seepage losses, thereby contributing less deep percolation water for salt loading to the Colorado River system.

Wyoming

NPDES Permits: The Wyoming Department of Environmental Quality (DEQ), Water Quality Division, administers the NPDES Program within the boundaries of the State of Wyoming. The Forum's "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program" is used and followed to evaluate industrial and municipal discharges. A total of fifty-four active NPDES permits are associated with facilities in the Wyoming portion of the Colorado River Basin.

There are currently thirty-five active NPDES permits issued to industrial facilities located in the Wyoming portion of the Colorado River Basin. The primary industrial source of salinity in the Green River Basin introduced through a point-source discharge is Pacificorp's Naughton Plant which discharges approximately ten tons of salt per day into a tributary of the Green River. The permit for this facility was issued on the basis that it was not "practicable" to implement the Forum policy of no discharge of salt from industrial sources, following a decision based upon a comparison of the costs of removing salt and downstream benefits associated with eliminating the discharge. The current permit, due to expire on July 31, 2003, requires a benefit/cost analysis to be conducted by July 31, 2001.

Of the remaining industrial discharges, two appear to be exceeding the Forum's policy limitations on TDS discharges. These are FMC Coke Plant, and the Pittsburg & Midway Coal Company's Skull Point Mine. Estimated average daily salt loadings from these facilities are 1.16 and 1.47 tons/day. However, data to support these estimates are incomplete. Therefore, discharges from these facilities will be evaluated in greater detail to determine the accuracy of these estimates, and, if necessary, permits will be modified such that policy compliance is achieved. There are no identified exceedences associated with the remaining industrial facilities. Permits for twelve of the facilities do not currently require TDS monitoring. These permits will be modified to incorporate monitoring necessary to assess compliance with Forum policy as the permits are renewed.

Nineteen permits are associated with domestic wastewater effluents. These permitted facilities serve a population of approximately 44,000. Of this total population, 33,000 are in Rock Springs and Green River. The wastewater treatment plant discharges at Rock Springs and Kemmerer/Diamondville are out of compliance with the policy in that their incremental increases are 450 mg/L and 468 mg/L respectively. The total populations associated with these towns are 20,000 in Rock Springs, and 3,900 in Kemmerer/Diamondville. The average flow volumes contributed to the system are 2.32 and 0.4 MGD respectively. At the next permit renewal, the DEQ will work with these municipalities to determine the feasibility of reducing TDS in conformance with Forum policies.

Permits for eleven municipal facilities are currently not in compliance with the policy in that the permits do not require monitoring for TDS. At the time of each permit renewal, DEQ will re-assess whether monitoring is necessary to assess compliance with Forum policy. TDS monitoring will be incorporated into the renewed permits if it is determined that there is a reasonable potential to exceed 1 ton/day or 350 tons/year of salt discharge.

Water Quality Management Planning: The Water Quality Management Planning and Nonpoint Source Implementation Programs in Wyoming are under the direction of the Water Quality Division of the Department of Environmental Quality. The Clean Water Report for Southwestern Wyoming addressed water quality in Lincoln, Uinta and Sweetwater Counties. This report was adopted at the local level, certified by the Governor, and conditionally approved by the EPA on October 9, 1980. The Governor's certification recognized a salinity control program for the Green River Basin as a major water quality priority. The State strongly supports the ongoing USDA-initiated salinity control effort on the Big Sandy River Unit.

The Statewide Water Quality Management Plan establishes an institutional framework under which planning and implementation activities can proceed in Wyoming. Implementation of most aspects of the program depends on the availability of funds and the acceptance of responsibilities by the designated management agencies. The Wyoming Statewide Water Quality Management Plan is amended regularly through adoption of the triennial review and its supplemental report.

The Wyoming Department of Environmental Quality, Water Quality Division, reorganized separate point and nonpoint source sections into a single watershed protection program. A strategy is being developed to assess and coordinate voluntary nonpoint source pollution control efforts more closely with point source permitting activities and groundwater protection initiatives. A five-year statewide monitoring plan has been established to assess water quality on a watershed-by-watershed basis. Watersheds in the Little Snake River Basin and most of the Green River Basin were sampled in 1998, and the remainder of the Green River is scheduled for assessment in year 2000.

The Wyoming 303(d) list of waters requiring the development of Total Maximum Daily Load (TMDL) qualification was published and approved by EPA in April, 1998. A total of 17 stream segments in the Colorado River Basin appear on the list. Only two streams in the Colorado River drainage were listed with credible impairments and neither were salinity related. Exceedences of the pH standard were found on the Hams Fork River near Kemmerer, and Haggerty Creek in the Little Snake Basin was listed for impairments associated with past hard rock mining activities. Both are slated for TMDL development in the next few years. The exact source of the pH problem on the Hams Fork has not yet been identified and a metals remediation plan on Haggerty Creek is currently being developed by the DEQ Abandoned Mine Lands Program.

New wasteload allocations were calculated upon renewal of NPDES discharge permits for the wastewater treatment plant discharges in Kemmerer and Mountain View in 1998. A new allocation will be calculated for the Town of Dixon when its NPDES permit is renewed in the year 2000.

The remaining 12 stream segments are waterbodies for which there is data indicating trends away from supporting designated uses. Four of these are located in the Green River Basin, and 8 in the Little Snake. All are listed for problems associated with silt and sediment, and though salinity is not identified as a problem, efforts to control sediment should also have a positive effect on salt loading. These 12 segments have a relatively low priority for TMDL development because of the existence of ongoing nonpoint source control projects associated with each.

In addition to the 303(d) listed streams, 27 other stream segments have been identified as having potential water quality impairments, but there are insufficient data to make a conclusive determination. These streams are all scheduled for further monitoring and assessment, and a final determination should be made on each by the year 2001.

The Wyoming Nonpoint Source Management Plan was initially approved by EPA in September 1989. The Plan calls for a cooperative, voluntary approach in the implementation of BMPs targeted at water quality improvements. As with the Statewide Water Quality Management Plan, implementation hinges upon acceptance of responsibilities by designated management agencies, and upon the availability of funding under Section 319. The State began a revision of the Nonpoint Source Management Plan in 1998 to conform to new EPA guidelines. The revised plan is expected to be completed and adopted prior to the FY 2000 319 grant allocations.

Wyoming began the triennial review of its surface water standards in 1998. A draft set of regulations was published in August 1998 containing major revisions to the standards program. The most important amendments involve changes to the stream classification system, updated numeric toxics criteria, and new antidegradation and mixing zone implementation procedures. Wyoming continues to support the salinity standards established by the Colorado River Basin Salinity Control Forum, and incorporates the Forum's numeric standards and implementation plans into its overall program. There are no changes proposed for salinity measures in the draft regulations.

Other Activities: There continues to be considerable interest in implementing a second U.S. Department of Agriculture salinity control project in the Black's Fork Basin in Wyoming. Landowners within the Bridger Valley Conservation District have closely followed the success of Wyoming's one ongoing salinity control project, the Big Sandy River Unit. A 1991 reconnaissance-level study by the Wyoming State Office of the Natural Resources Conservation Service indicated the considerable potential to significantly reduce salt loading into the Black's Fork, Henry's Fork and Ham's Fork tributaries of the Green River, and estimated the cost-effectiveness of controlling such salt-loading to be more expensive than the Big Sandy Unit, but at a per-ton cost which would be competitive with other salinity control projects now being implemented. The State of Wyoming is supportive of the initiation of a second on-farm salinity control project in Wyoming, and is continuing to look for ways to get a Black's Fork area project started.

CHAPTER 5 - MEANS OF MAKING PLAN OPERATIONAL

Overview

The Forum has as its objective the overall coordination and implementation of projects, and the continuing review of salinity changes and program effectiveness. At least every three years, the Forum considers existing and projected water depletions and salt concentrations and, as needed and feasible, recommends revisions in the schedule for implementing salinity control measures and/or modifications of the numeric criteria. The Review includes examination of both federal and non-federal programs. The Review is transmitted to the EPA and state water resources and pollution control agencies, and is made available to others interested in the Colorado River Basin Salinity Control Program. A key conclusion of this Review was set forth in Chapter 3 wherein the Basin states find that the present numeric criteria are appropriate and no change in them is recommended at this time.

The means of making the plan of implementation operational consists of having coordinated planning for additional salt removal and seeking the necessary appropriations for carrying out those goals. Accomplishment of the Salinity Control Program is dependent upon funding of the efforts included in the plan of implementation. This is dependent upon agency budgetary requests being made, Congressional appropriations being secured, and irrigation modifications and other salt loading reduction practices being put into place and then kept operational. The amount of funds brought to parallel the federal program by the Basin states' cost sharing is dependent on the federal appropriations.

Program Development and Implementation

Several significant legislative changes concerning the Salinity Control Program have occurred since the adoption of the 1996 Review by the Colorado River Basin Salinity Control Forum. These changes have affected both Reclamation and the Department of Agriculture's (USDA) salinity control programs and have given direction to the Bureau of Land Management (BLM). However, the Salinity Control Program is not static; it is dynamic and, hence, the program needs to be constantly evaluated, with changes being identified and implemented, if needed.

The Basinwide Program authorized in 1995 for Reclamation appears to be proceeding in a very timely way to implement cost-effective measures. However, when the legislation was enacted, a $75 Million ceiling was imposed by the Congress with the thought that the Basinwide Program would be reviewed after a period of time to see if it was as successful as had been anticipated. It was expected that, with a successful review of the newly implemented program, Congress would increase the ceiling authorized for expenditures. The funds that have been committed or are anticipated to be committed in the near-term point to the need for the Congress to act in the near future to raise the

ceiling. Hence, legislation should be introduced and supported so that there will not be a break in the funding provided to Reclamation's Basinwide Program.

USDA's salinity control program, since the passage of FAIRA, has been inadequately funded, and USDA still must demonstrate its ability and willingness to adapt EQIP to the Salinity Control Program and designate an adequate amount of funds from the EQIP funding authority to the Salinity Control Program. If it cannot be demonstrated that the EQIP program can be successfully used by USDA to fulfill its role in the Salinity Control Program, then consideration needs to be given to new legislative authority and new line-item funding by the Congress. It was the FAIRA legislation in 1996 that authorized the Basin states' cost-sharing up-front from the Basin states' funds for both the Reclamation Basinwide Program and USDA's EQIP program. The implementation of this act's cost-sharing provision was perhaps the most significant event with respect to salinity control that occurred since the 1996 Review.

The management philosophy of BLM has not allowed for a direct approach to salinity control by this agency. Identification of an effective plan, as directed by the Congress, has not been forthcoming, according to budget documents. Recent efforts by coordinators within BLM shows some prospect that there will be more attention given to water quality issues, specifically to the Colorado River Basin Salinity Control Program. If BLM is not able to focus on its role in salinity control, then alternative approaches to obtaining the desired collaborative partnership with this federal land management agency will need to be examined.

The USGS streamflow gaging and water quality sampling activities, and the long-standing periods of record at existing stations, are essential to the monitoring and evaluation of salinity control effectiveness. USGS should continue to seek funding under its existing authority for flow gaging and water quality stations in order to provide necessary data for the evaluation of the short-term and long-term effectiveness of the Colorado River Basin Salinity Control Program.

Continuation of the USGS trend to cut funding for its cooperative gaging program will impact the ability to adequately assess the effectiveness of salinity control projects through the loss of data from needed gaging stations.

Education and Public Involvement

Salinity in the Colorado River is a basinwide problem, with implications ranging over the entire 246,000 square mile drainage area. The Basin's immense size highlights the need for effective public education and public involvement programs due to the physical and cultural diversities which exist across the seven states. Implementation of measures to control complex problems such as salinity requires awareness, concern and involvement, along with recognition that a problem many miles away may have direct impacts. The states individually, and together, as the Forum, have and will continue to work with concerned agencies, both state and federal, to increase the public understanding of the salinity problem and its control.

A major thrust of the public education/public involvement effort focuses on educating irrigators as to the sources, impacts and methods of controlling salinity. Improved irrigation practices will reduce the input of salts into the River system. The goal is to encourage desirable changes in water application technology and management practices. The Basin states work within the framework of ongoing efforts by federal, state and local organizations to achieve this goal. Assistance from the Executive Director of the Forum is also provided. The plan formulation phase of Reclamation, USDA, and BLM salinity control efforts provide an excellent opportunity for public education with regard to Colorado River salinity and the means for its control.

Meetings of the Colorado River Basin Salinity Control Forum are open and the public is welcome to attend. All input, whether oral or written, is considered and acted on as appropriate by the Forum. The Forum also provides for public involvement in the water quality standards review process as public meetings are held to receive comments on the salinity standards during each triennial review. As a result of public input, appropriate adjustments to the program are made.

As each of the Basin states proceeds with its own process to review the standards, one or more state-wide public hearings are held. In addition, there is widespread announcement of Forum and state hearings, and copies of the Review and associated state standards are mailed to interested agencies, groups and individuals. Forum members participate with their own state's water quality planning agencies in matters related to salinity and salinity control and will continue to do so as the need arises.

Forum Activities

The Forum meets at least twice a year, or as needed, to discuss the Salinity Control Program, the efforts of the federal agencies and the states, and the need for additional policy and/or action by the Forum. During the last triennial review effort, the Forum met on June 6, 1996 in Breckenridge, Colorado and adopted the preliminary review report for 1996. The Forum then held public meetings during the late summer and, after receiving comments, prepared a supplemental report dated October 1996.

During the current reporting period, the Forum met on October 23, 1996 in Palm Desert, California; May 20, 1997 in Salt Lake City, Utah; October 22, 1997 in Tucson, Arizona; June 17, 1998 in Cheyenne, Wyoming; and October 20, 1998 in Santa Fe, New Mexico. Since the creation of the Forum in November 1973, the Santa Fe meeting was the 59th meeting. The Forum has published a three-volume compilation of all of the minutes of the Forum meetings, one volume from 1973 through 1985, another from 1986 through 1991, and one from 1992 through 1996. The Forum held its 60th meeting on May 27, 1999 in Durango, Colorado, approved this report, and authorized its printing for mailing. It also scheduled public meetings. The Forum plans to make final the adoption of this report at a meeting in the fall of 1999, and perhaps publish a supplemental report.

A Work Group, created by the Forum, holds meetings on a more frequent basis to review technical information which is generated by the federal agencies. Membership on the Work Group is composed of technical representatives from each of the seven Basin states, and the Executive Director of the Forum. Federal agency representatives, however, attend meetings of the Work Group and informally exchange information, ideas and viewpoints. The Work Group coordinates the efforts of the Basin states and reports back to the Forum any actions which the Work Group believes the Forum should consider.

Positions have been taken on many issues, such as the need for appropriation of funds by the Congress for salinity control. Federal agencies have also prepared numerous reports in the three-year period. The Forum has compiled a library of many reports relating to Colorado River salinity. The Work Group and the Forum have had the opportunity to review and comment on these reports in draft form. Notable among the reports done since the last triennial review is a report which is prepared by the Bureau of Reclamation and submitted to Congress every two years. The last of these publications is Quality of Water, Colorado River Basin, Progress Report No. 19, January 1999, U.S. Department of the Interior. In addition, the Forum and the Work Group have, over the last three years, assisted the Colorado River Basin Salinity Control Advisory Council in the preparation of three annual reports.

Financing Salinity Control Activities

By enacting the 1974 Act, Congress recognized the federal role and responsibility for controlling the salinity of the Colorado River, and adopted a cost-sharing formula which provided that 75 percent of the costs of the four originally authorized Department of the Interior salinity control projects under Title II of the Act are non-reimbursable. The remaining 25 percent of the costs are to be repaid from the Upper and Lower Basin funds over a 50-year period without interest. The maximum allocation to the Upper Basin fund is not to exceed 15 percent of the total costs to be repaid from the two funds, with the remainder to be repaid by the Lower Basin fund.

The 1984 amendments to the 1974 Act changed the cost-sharing formula. For the Department of the Interior program, the non-reimbursable portion was reduced to 70 percent, with the remaining 30 percent to come from Upper and Lower Basin funds in the same proportionate share as under the 1974 Act. However, the Upper Basin fund could repay its share over 50 years with interest, and the Lower Basin could reimburse its share of the annual expenditure during the year that costs are incurred.

The USDA salinity control program, as amended in 1996 by FAIRA, requires at least a 25 percent non-federal cost-share for participation. In addition, the legislation allows for the Basin funds to cost-share up to 30 percent. Money is available in the Basin funds for this purpose.

Table 5-1 provides a compilation of the amount of funding provided to Reclamation, USDA, and BLM for the Colorado River Basin Salinity Control Program from Fiscal Year (FY) 1988 to the

present. Funding levels for salinity control activities by BLM continue to be difficult to ascertain due to the fact that the BLM budget does not contain a specific line item for salinity control.

Table 5-1
Summary of Colorado River Basin Salinity Control Program
Funding For the Bureau of Reclamation,
the Department of Agriculture and the Bureau of Land Management
By Federal Fiscal Year Since 1988
(In Dollars)*

Federal Fiscal Year	Bureau of Reclamation	Department of Agriculture	Bureau of Land Management
1988	20,783,000	3,804,000	500,000
1989	16,798,000	5,452,000	500,000
1990	14,185,000	10,341,000	700,000
1991	24,984,000	14,783,000	873,000
1992	34,566,000	14,783,000	873,000
1993	33,817,000	13,783,000	866,000
1994	32,962,000	13,783,000	800,000
1995	12,540,000	4,500,000	800,000
1996	8,205,000	9,561,000	800,000
1997	5,000,000	3,152,000	800,000
1998	7,600,000	3,906,000	800,000
1999	11,500,000	5,132,000	800,000

* Numbers do not include funds provided for the Reclamation and Agriculture programs as up-front cost-sharing from the Basin Funds.

While the USDA program has proven to be a cost-effective component of the Colorado River Basin Salinity Control Program, Administration and Congressional funding support for the program has dramatically declined. Table 5-1 reflects the significant reduction in USDA appropriations between 1994 and 1999. Funding of the USDA program at recent levels jeopardizes the ability of the plan of implementation to be executed in a manner that assures compliance with the numeric criteria.

The 1984 Amendments to the Act (P.L. 98-569) provide that Reclamation is authorized to reimburse the costs of operation and maintenance expenses in excess of those that would have occurred for the thorough and timely operation and maintenance of the unimproved system. Those

amendments also allow the federal government to pay for replacement costs of the facilities and the costs of operation and maintenance of works to replace impacted fish and wildlife values.

The 1995 Amendments to the Act (P.L. 104-20) did not change the cost-sharing and repayment relationships among the states or the federal government, but it did provide additional flexibility to Reclamation if the proposed project has other associated indirect benefits of federal interest, i.e., other water quality or environmental benefits. The cost of this assistance will not be considered a salinity control cost. The 1996 Amendments to the Act (P.L. 104-127) permit up-front cost sharing by the Lower Basin in lieu of repayment over time of federal expenditures.

Revenues accruing to the Lower Basin fund for the Salinity Control Program are derived from a 2½ mill per kilowatt hour levy on California and Nevada purchases of hydro power generation. Revenues accruing to the Upper Basin fund are collected by the Western Area Power Administration. The plan of implementation, as presented earlier in this Review, incorporates a construction schedule which, when completed, will have a total estimated cost of $661 million. Under this Plan, the required salinity reduction can be made throughout the planning period (2015), which includes efforts to eliminate the shortfall as soon as possible but at least within six years, and monies in the Lower Basin fund will be adequate to up-front cost-share or meet its repayment obligation.

Two potential sources of funding to assist salinity control efforts exist under the Clean Water Act. Through FY 1999, Congressional appropriations for Section 319 nonpoint source control funds are nearly $190 Million. Section 319 funds are available for implementing state-adopted EPA-approved nonpoint source management programs. The construction grant program has now essentially been replaced by the State Revolving Fund (SRF) program, which provides low interest loans for pollution control projects. Under Section 603(c)(2), the SRF program can be used to fund implementation of Section 319 projects.

Responsibility for Accomplishing Salinity Control Measures

The plan of implementation recognizes that the Forum, participating federal agencies, and the Basin states each have specific responsibilities for furthering the Salinity Control Program. The elements of the plan of implementation are premised on completion of all of the salinity control measures discussed in Chapter 4 of this report. Specifically, the Forum will continue to provide overall coordination, a continuing review of salinity changes, program effectiveness, and the need to make further program changes and improvements. At least every three years, the Forum considers existing depletions and salt concentrations and, when needed and feasible, recommends revisions in the schedule for implementing salinity control measures and/or modifications of the numeric criteria. This review includes both federal and non-federal programs. The review is then transmitted to the EPA and to state water resources and pollution control agencies and made available to others interested in the Salinity Control Program.

Federal agencies must complete planning efforts and seek authorization and funding for salinity control efforts in accordance with Title II of P.L. 93-320, P.L. 98-569, P.L. 104-20, and P.L. 104-127. The Basin states will continue to encourage the agencies to request funding and to lend their support to obtaining needed funding from the Congress.

Interagency Coordination

Combined Efforts

The Colorado River Basin Salinity Control Program is truly a unique program, and it cannot be successful without the cooperation of a multitude of agencies and governments involved at the local, state and federal levels. First, the program is reliant upon the cooperation of landowners in implementing important and cost-effective salinity control measures. Secondly, the program is dependant upon a multitude of agreements between the seven Colorado River Basin states which have always been accomplished by consensus. Lastly, the program depends upon the cooperation of a number of federal agencies for its success. Public Law 93-320, the Colorado River Basin Salinity Control Act, gives to the Secretary of the Interior responsibilities for implementing salinity control policies adopted for the Colorado River and gives to the Secretary of the Interior many other responsibilities through various sections of the Act.

The Act states: "The Secretary (of the Interior), the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture are directed to cooperate and coordinate their activities effectively to carry out the objectives of this title." The Act further provides that "the Secretary (of the Interior) or the Secretary of Agriculture, as the case may be, shall give preference to those additional units or new self-contained portions of units which reduce salinity of the Colorado River at the least cost per unit of salinity reduction." It is obvious that the federal implementing agencies, that is, Reclamation, BLM, and USDA, must coordinate and cooperate in order to advance, as required by the Act, a cost-effective Salinity Control Program. The lead in fostering this cooperation has been taken by Reclamation. The future success of the program is dependent upon this coordination and cooperation, and the Forum finds that the federal agencies need to be more pro-active in ensuring that their efforts are well understood by all of the involved federal agencies and that the programs being implemented are coordinated to the extent possible.

In addition to the three implementing agencies, there are other federal agencies which are involved in the Salinity Control Program, and cooperation and coordination with these agencies is also most essential. Three agencies are notable; USGS, USF&WS and EPA.

Salinity Control Advisory Council

Cooperation between the federal agencies and the Basin states is also essential, and the program has advanced because of a spirit of good will and a desire to succeed in controlling the salinity of the Colorado River expressed by all of the states and the federal agencies. To ensure that

there would be communication and cooperation, in the Colorado River Basin Salinity Control Act, the Congress created the Colorado River Basin Salinity Control Advisory Council, which is to be composed of no more than three members from each state appointed by the Governors of each of the Colorado River Basin states. The Act directs that the Council shall, among other things, "act as a liaison between both the Secretaries of the Interior and Agriculture and the Administrator of the Environmental Protection Agency and the states in accomplishing the purposes of this title." The Act further directs that the Secretary will make reports to the Advisory Council, and that the Advisory Council will "recommend to both the Secretary and the Administrator of the Environmental Protection Agency appropriate studies to further projects, techniques, or methods for accomplishing the purposes of this title."

U.S. Fish & Wildlife Service (USFWS)

Pursuant to authorities and responsibilities as set forth in the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, and the Migratory Bird Treaty Act, the U.S. Fish and Wildlife Service (USFWS) is an active participant in the Colorado River Basin Salinity Control Program. It is primarily through these legislative authorities that the USFWS coordinates with lead Federal agencies and the Basin states.

The Colorado River Basin supports a biological diversity of fish and wildlife resources, as well as a significant number of unique species and important habitats. The Colorado River system has one of the largest number of threatened and endangered species of fish and wildlife in the United States, while providing important habitats for other biological resources of regional, national, and international significance, including: Neotropical migratory birds, migratory waterfowl (ducks, geese, and shorebirds), rare non-migratory birds such as sage grouse, and many economically important species of big game. In addition, specialized habitats such as wetlands and riparian areas provide nesting/rearing habitat for over 200 species of mammals, birds, and amphibians.

In general, USFWS activities consists of coordination with lead federal agencies in evaluating potential impacts to fish and wildlife resources resulting from proposed salinity control projects. Documentation of USFWS concerns and recommendations are typically in the form of Fish and Wildlife Coordination Act reports, Planning Aid Memorandum, biological opinions, and comments on Draft and Final Environmental Assessments and Environmental Impact Statements. Follow-up coordination with project sponsors to ensure appropriate mitigation is also a major thrust of the USFWS. The Salt Lake City, Utah Field Office (Ecological Services) provides overall program coordination for the USFWS.

USFWS participation in the planning process for salinity control projects is provided through a variety of planning/working/coordinating activities and interactions with Reclamation, BLM, EPA, Natural Resource Conservation Service (NRCS), the Forum, state agencies, Indian tribes, and the general public. General fish and wildlife information, as well as lists of threatened and endangered species and their critical habitats which may occur within salinity control project areas, are provided by the USFWS to the lead federal agencies and other interested parties. Biological opinions rendered under authority of the Endangered Species Act are provided for projects where threatened

and endangered species may be affected. Concerns continue to arise over the anticipated effects of salinity control measures on endangered species and wetlands.

Authorization of new salinity control projects will still require in-depth review by the USFWS to ensure the appropriate protection for endangered species and their critical habitats, as well as the replacement of wetland values potentially lost due to construction and operation of new features. USDA's former authorization to mitigate incidental fish and wildlife values lost (on-farm) on a voluntary basis, has been replaced by EQIP. The USFWS will need to more closely monitor the effectiveness of EQIP in achieving adequate mitigation/compensation, both in proportion to and concurrent with various salinity reducing construction practices. Concepts such as mitigation banking may be explored by all participating state and federal agencies to accomplish satisfactory compensation/mitigation results.

U.S. Geological Survey (USGS)

The USGS's Water Resources Division provides and analyzes hydrologic information to assess the nation's water resources. Programs are developed with cooperation and financial support from state, local and other federal agencies. The programs provide hydrologic and geochemical information for evaluation of surface and ground water systems, as well as for management and policy decisions.

To provide information required by the federal, state and local agencies to address Colorado River water quantity and quality issues, the USGS operates and maintains a network of about 520 stream gaging stations and 140 water quality stations in the Colorado River Basin. Streamflow and water-quality information from these stations provide input to the hydrologic database for Reclamation's Colorado River Simulation System. In addition to collecting hydrologic data, the USGS conducts specific studies on surface water, ground water, and water quality.

Environmental Protection Agency (EPA)

The major EPA programs relating to Colorado River salinity control are: (1) water quality management planning; (2) water quality standards; (3) National Pollutant Discharge Elimination System (NPDES) permits; (4) review of National Environmental Policy Act (NEPA) documents; (5) nonpoint source control under Section 319 of the Water Quality Act of 1987; (6) wetlands protection; and (7) the Underground Injection Control (UIC) Program. For the most part, these programs are either implemented by the states under federal statute, (such as the water quality standards program), or delegated to the states by EPA (such as the NPDES program). EPA maintains oversight responsibilities for the assumed and delegated programs, and has responsibility for reviewing and approving water quality standards, including those for salinity. EPA continues to encourage the Basin states to develop and implement the basinwide and state salinity control strategies.

Section 303 of the Clean Water Act (CWA) requires states to adopt water quality standards pursuant to their own laws which are consistent with the applicable requirements of the CWA. The Colorado River Basin Salinity Control Forum, through its Work Group, has been re-affirming the numeric criteria for salinity and developing a new Basinwide plan of implementation for salinity control for the seven Basin states every three years to satisfy the triennial review requirements of the CWA. Following adoption of the standards by each state, it is the responsibility of the EPA regional administrators to approve or disapprove the standards based on consistency with CWA requirements.

Pursuant to Section 309 of the Clean Air Act, EPA reviews NEPA environmental assessments and environmental impact statements for both salinity and non-salinity control projects of other agencies. Through review of NEPA documents, EPA urges the identification of potential salinity impacts and encourages discussion of mitigation of adverse impacts as required by the Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500-1508). For example, EPA can comment on potential salinity impacts, when appropriate, when reviewing EIS's for grazing and land management, recreational developments, mining, and water development projects. In addition, EPA encourages the development of mitigation measures for adverse impacts to satisfy state and Forum policies for salinity control and through CWA Section 401 certifications for activities subject to federal permitting actions. The Forum policy encouraging the use of water with higher total dissolved solids for industrial purposes is being supported primarily through NEPA review responsibilities.

The basis for wetland protection and mitigation is established in the regulations for compliance with NEPA, Section 404 of the CWA, Executive Order 11990, and USDA policy. However, preserving irrigation-induced wetlands and reducing salt loading to the Colorado River may present conflicts between authorizing legislation and other regulatory programs. A portion of the salt load in the Colorado River system is attributed to seepage and deep percolation from leaking irrigation canals and laterals, and inefficient on-farm irrigation systems and water management. Some of these inefficient irrigation systems and practices are the source of water for many of the wetlands associated with salinity control units. As seepage from irrigation systems is reduced and irrigation efficiencies are improved, some portion of these irrigation-induced wetlands may be impacted or lost. The concept of replacing irrigation-induced wetlands and the need to reduce the salt load in the Colorado River presents difficult choices between environmental values of improved water quality and wetland preservation. Landowners are volunteering to implement wildlife habitat practices, including wetland replacement, as was contemplated by the Salinity Control Act. EPA utilizes NEPA review and other types of coordination with state and federal agencies as the means to participate in wetland assessment, monitoring, replacement, and reporting activities.

Section 319 funds have been appropriated since FY 1990 for the states to implement nonpoint source water pollution control programs. EPA encourages the states to consider salinity control benefits as they make decisions on Section 319 funding for their priority watersheds.

EPA Region VIII administers the Underground Injection Control permit for the Paradox Well salinity control project in Colorado.

CHAPTER 6 - SALINITY STANDARD ADOPTION & IMPLEMENTATION PROCESS

Standards Review Procedures

The Forum, on September 20, 1974, approved a statement of "Principles and Assumptions for Development of Colorado River Salinity Standards and Implementation Plan." Under Principle 7, it is stated:

> *The plan of implementation shall be reviewed and modified as appropriate from time to time, but at least once each 3 years. At the same time, the (numeric) standards, as required by Section 303(c) (l) of P.L. 92-500 shall be reviewed for the purpose of modifying and adopting standards consistent with the plan so that the Basin states may continue to develop their compact-apportioned waters while providing the best practicable water quality in the Colorado River Basin.*

The Colorado River Basin is a large and complex area with many water-quality and water-supply problems. A wide range of research, technical studies, and actions are underway, and much knowledge is yet to be gained. Such studies can bring to the issues a better understanding of natural and human induced salinity sources, and a better comprehension of trends in salt concentrations in the River. This will assist in predictions of future water quality. Reclamation is advancing a new computer model of the Colorado River to help in this regard. Studies are underway to allow for a better understanding of the impacts of salts in the Colorado River on water users. These efforts point to the need for ongoing review of the standards. They also promise a more comprehensive understanding of the River system, which will assist in accomplishing future reviews.

The Forum's Work Group keeps current with salinity control efforts, and suggests revisions as appropriate. The Work Group was particularly active in preparing drafts of the 1999 Review, will assist in the preparation of a supplement, if needed, and will aid the Forum in holding public hearings. The Work Group meets often, as needed, and operates under a schedule which enables the Forum to take action on potential revisions in a timely manner.

For this 1999 Review, after Forum approval, and prior to state action on the review of the numeric criteria and plan of implementation, public review and discussion will be sought by the Forum through public meetings. The Forum will hold at least two regional meetings in the Colorado River Basin to describe the basinwide nature of the salinity problem, the ongoing control program and plan of implementation as recommended in this report, and to solicit comments and views from interested agencies, groups and individuals.

No change has been made in the numeric criteria since their adoption in 1975 by the Basin states and approval by EPA. After having conducted this Review, the Forum has again found the

numeric criteria to be appropriate and recommends no changes in this criteria. By this Review, as has been the case every three years, the Forum has adopted an updated plan of implementation.

Adoption by States

After the final adoption of this report, and perhaps a supplemental report, by the Forum in the fall of 1999, each of the seven Colorado River Basin states will include the report as a part of its own water quality standards and, through procedures established by each state, consider the Review, potentially adopt it, and then submit the report to the appropriate Regional office of EPA for approval. Because the Colorado River Basin contains portions of three EPA regions, Utah, Colorado and Wyoming will make submittals to the EPA Region VIII in Denver, Colorado; New Mexico to EPA Region VI in Dallas, Texas; and Nevada, Arizona and California to EPA Region IX in San Francisco, California.

Action

Although the formation horizon in this report for the plan of implementation extends through the year 2015, there is an urgency to accomplish parts of the plan prior to the next triennial review in the year 2002. With the adoption of this report, the Forum and the states become committed to that end. The federal agencies are a critical part of the Colorado River Basin Salinity Control Program. It is believed that by their involvement in the preparation of this report, those federal agencies will support the plan of implementation and its programs. It is also anticipated that EPA, by approval of the states' submittals, will fully support this salinity control effort.

APPENDIX A

Regulatory History

Title 40 - Protection of Environment
Chapter 1 - ENVIRONMENTAL PROTECTION AGENCY
[FBL 298-5]
Part 120 - WATER QUALITY STANDARDS

Colorado River Systems; Salinity Control Policy and Standards Procedures

The purpose of this notice is to amend 40 CFR Part 120 to set forth a salinity control policy and procedures and requirements for establishing water quality standards for salinity and a plan of implementation for salinity control in the Colorado River System which lies within the State of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming pursuant to section 303 of the Federal Water Pollution Control Act, as amended (33 U.S. C. 1313). A notice proposing such policy and standards procedures was issued on June 10, 1974 (39 FR 20703, 39 FR 24517).

High salinity (total dissolved solids) is recognized as a significant water quality problem causing adverse impacts on water uses. Salinity concentrations are affected by two basic processes: (a) Salt loading - the addition of mineral salts from various natural and man-made sources, and (b) salt concentrating - the Loss of water from the system through stream depletion.

Studies to date have demonstrated that the high salinity of stream systems can be alleviated. Although further study may be required to determine the economic and technical feasibility of controlling specific sources, sufficient information is available to develop a salinity control program.

Salinity standards for the Colorado River System would be useful in the formulation of an effective salinity control program. In developing these standards, the seven States must cooperate with one another and the Federal Government to support and implement the conclusions and recommendations adopted April 27, 1972, by the reconvened 7th Session of the conference in the Matter of Pollution of the Interstate Waters of the Colorado River and its Tributaries.

Public hearings on the proposed regulation were held in Las Vegas, Nevada on August 19, 1974, and in Denver, Colorado, on August 21, 1974. Public comments were provided at the hearings and also by letter during the review period. A summary of major comments and Environmental Protection Agency response follows:

(1) The Colorado River Basin Salinity Control Forum stated that it did not object to the proposed regulations, and believed that it satisfied the requirements of section 303 (b)(2) of P.L. 92-500 until October 18, 1975. The Forum reported that the seven Colorado River Basin States were actively working on the development of water quality standards and a plan of implementation of salinity control.

(2) The Colorado River Water Conservation District inquired as to whether the definition for the Colorado River Basin contained in Article II(f) of the Colorado River Compact of 1922 would be followed in the development of salinity standards and the salinity control plan.

The requirement of establishing water quality standards and an implementation plan apply to the Colorado River System as defined in Part 120.5(a) of this regulation. This definition is consistent with the definition of the Colorado River System contained in Article II(f) and II(g) define the Basin to include the System plus areas outside the drainage area which are served by the Colorado River System. The Environmental Protection Agency (EPA) will require that the standards and implementation plan consider the impacts of basinwide uses, e.g. transmountain diversions, on salinity effects in the System, but the establishment of standards and implementation plans pursuant to this regulation will not be required for streams located outside the System.

The District also questioned the feasibility of relying on irrigation improvement programs as a means of alleviating the salinity problem.

EPA believes that adequate information is available to initiate controls for irrigated agriculture, yet at the same time acknowledges that additional work is needed to demonstrate the efficacy of certain control measures. Projects presently being supported by EPA and others should demonstrate the adequacy of various control measures including management and non-structural techniques. These measures will be considered during the development of the implementation plan.

(3) The Environmental Defense Fund (EDF) testified that it believed that EPA was not complying with the requirements of the Federal Water Pollution Control Act, as amended, chiefly because of EPA's late response to the timetable delineated in the Act for establishing standards, and also because numerical standards still have not been set for the Colorado River System. EDF called upon EPA to withdraw the proposed regulation and promptly promulgate numerical limits for salinity.

EPA believes that a move to promulgate numerical standards at this time should cause even further delays in controlling salinity due to the problems involved with obtaining interstate cooperation and public acceptance of such a promulgation.

(4) The Sierra Club raised a number of objections to the proposed regulation, principally because, in its opinion, it permits further development of the water of the Colorado River without requiring that adequate salinity controls be on line prior to development. Specific suggestions are:

(a) Section 120.5(e)(3). Shorten the deadline for submission of the standards and implementation play to May 30, 1975.

EPA believes that this would not allow adequate time due to the complexities of the problem, the interstate coordination needed and the time requirements for public hearings. The October 18, 1975 date is consistent with the requirements of the Federal Water Pollution Control Act, as amended, for the three year review and revision of standards. The schedule set forth by the Colorado River Basin Salinity Control Forum calls for development of draft standards and an implementation plan by February 1975 in order to allow time for public participation prior to promulgation.

(b) Section 120.5(c)(2). Delete "as expeditiously as practicable."

The date of July 1, 1983, remains the goal for accomplishment of implementation plans as stated in § 120.5(c)(2)(iii). It is the purpose of this language to accelerate progress by the States toward this goal where possible.

(c) Delete "while the basin States continue to develop their compact apportioned waters."

In recognition of the provisions of the Colorado River Compact of 1922 and until such time that the relationship between the Compact and the Federal Water Pollution Control Act, as amended, is clarified, EPA believes that development may proceed provided that measures are taken to offset the salinity increases resulting from further development.

(d) Section 120.5(c)(2)(iv). Add language to describe conditions under which temporary increases above the 1972 levels will be allowed.

EPA believes that this matter should be addressed in further detail in the formulation review and acceptance of the implementation plan, not in the regulation.

(e) Add a new subsection on financing on control measures.

EPA believes that this, too, is an issue that should be handled as part of the implementation plan.

(f) Add a new subsection delineating requirements for evaluating control plans and restricting consideration of controls for the Blue Spring on the Little Colorado River.

EPA believe these issues should also be addressed as part of the implementation plan. It should be noted that nothing in this regulation removes the requirement for assessing environmental impacts and preparing environmental impact statements for control measures.

(g) Add a new section requiring public hearings.

EPA's public participation regulations appear at 40 CFR 105 and apply to all actions to be taken by the States and Federal Government pursuant to the Act. States have provided for public participation throughout the initial water quality standards review process. We expect the States to do so in this situation and see no need to set forth additional requirements.

(h) Add a new section stating that the implementation plan will be published in the Federal Register.

EPA expects there will be substantial public participation at the State and local level prior to adoption of the plan. The salinity standards are expected to be published in the Federal Register, but the size and complexity of the plan may militate against its publication. At the very least, the plan will be available for review at appropriate EPA and State offices. Notice of its availability will be published in the Federal Register, and 60 days will be allowed for public review and comment.

(i) Add new subsection stating that EPA will promulgate standards if the States fail to do so as prescribed in this regulation.

Section 303 of the Federal Water Pollution Control Act provides for promulgation by EPA where the States fail to adopt standards requested by the Administrator, or where the Administrator determines Federal promulgation is necessary to carry out the purpose of the Act. EPA's responsibility to promulgate standards if the States fail to do so is thus expressed in the Statute itself; the Agency does not believe that recitation of the statutory duty in this particular rulemaking is necessary.

(5) The American Farm Bureau Federation, California Farm Bureau Federation, Nevada Farm Bureau Federation, and the New Mexico Farm and Livestock Bureau believe that standards should not be set until further evaluation of the problems and opportunities for control are completed.

EPA believes that adequate information is available for setting standards and formulation controls, and while it recognizes that additional work is needed on specific aspects of solutions, it believes that further delay without any action is not appropriate.

Records of the hearings and comments received by letter during the review period are available for public inspection at the regional offices of the Environmental Protection Agency at 1860 Lincoln Street in Denver, Colorado, at 100 California Street in San Francisco, California, at 1609 Patterson Street in Dallas, Texas, and at the Environmental Protection Agency Freedom of Information Center at 401 M Street SW in Washington, D.C.

This regulation sets forth a policy of maintaining salinity concentrations in the lower main stem of the Colorado River at or below 1972 average levels and requires the Colorado River System States to promulgate water quality standards. The first step will be the establishment of procedures within 30 days of the effective date of these regulations which will lead to adoption on or before October 18, 1975, of water quality standards for salinity including numeric criteria and an implementation plan of salinity control.

Except as provided in this regulation the interstate and intrastate standards previously adopted by the States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming and approved by the Environmental Protection Agency are the effective water quality standards under section 303 of the Act for interstate and intrastate waters within those States. Where the regulations set forth below are inconsistent with the referenced state standards, these regulations will supersede such standards to the extent of the inconsistency.

In consideration of the foregoing, 40 CFR Part 120 is amended as follows:

1. Section 120.5 is added to read as set forth below:

§ 120.5 Colorado River System Salinity Standards and Implementation Plan.

(a) "Colorado River System" means that portion of the Colorado River and its tributaries within the United States of America.

(b) It shall be the policy that the flow weighted average annual salinity in the lower main stem of the Colorado River System be maintained at or below the average value found during 1972. To carry out this policy, water quality standards for salinity and a plan of implementation for salinity control shall be developed and implemented in accordance with the principles of paragraph (c) below.

(c) The States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming are required to adopt and submit for approval to the Environmental Protection Agency on or before October 18, 1975:

(1) Adopted water quality standards for salinity including numeric criteria consistent with the Policy stated above for appropriate points in the Colorado River System; and

(2) A plan to achieve compliance with these standards as expeditiously as practicable providing that :

(i) The plan shall identify State and Federal regulatory authorities and programs necessary to achieve compliance with the plan.

(ii) The salinity problem shall be treated as a basinwide problem that needs to be solved in order to maintain lower main stem salinity at or below 1972 levels while the basin States continue to develop their compact apportioned waters.

(iii) The goal of the plan shall be to achieve compliance with the adopted standards by July 1, 1983. The date of compliance with the adopted standards shall take into account the necessity for Federal salinity control actions set forth in the plan. Abatement measures within the control for the States shall be implemented as soon as practicable.

(iv) Salinity levels in the lower main stem may temporarily increase above the 1972 levels if control measures to offset the increases are included in the control plan. However, compliance with 1972 levels shall be a primary consideration.

(v) The feasibility of establishing an interstate institution for salinity management shall be evaluated.

(d) The States are required to submit to the respective Environmental Protection Agency Regional Administrator established procedures for achieving (c)(1) and (c)(2) above within 30 days of the effective date of these regulations and to submit progress reports quarterly thereafter. EPA will on a quarterly basis determine the progress being made in the development of salinity standards and the implementation plan.

§ 120.10 [Amended]

§ 120.10 is amended by adding to the paragraphs entitled "Arizona", "California", "Colorado", "Nevada", "New Mexico", "Utah", and "Wyoming" a salinity control policy and procedures and requirements for establishing water quality standards for salinity control in the Colorado River System.

(Sec. 303, Pub. L. 82-500, 56 Stat. 816 (33 U.S.C. 1313))

Effective date: December 18, 1974.
Dated: December 11, 1974

APPENDIX B

Forum Policies

POLICY FOR IMPLEMENTATION OF COLORADO RIVER SALINITY STANDARDS THROUGH THE NPDES PERMIT PROGRAM

Prepared by
The Colorado River Basin Salinity Control Forum

February 28, 1977

In November 1976, the United States Environmental Protection Agency Regional Administrators notified each of the seven Colorado River Basin states of the approval of the water quality standards for salinity for the Colorado River System as contained in the document entitled "Proposed Water Quality Standards for Salinity Including Numeric Criteria and Plan of Implementation for Salinity Control, Colorado River System, June 1975," and the supplement dated August 25, 1975. The salinity standards including numeric criteria and a plan of implementation provide for a flow weighted average annual numeric criteria for three stations in the lower main stem of the Colorado River: below Hoover Dam, below Parker Dam, and at Imperial Dam.

The Plan of Implementation is comprised of a number of Federal and non-Federal projects and measures to maintain the flow-weighted average annual salinity in the Lower Colorado River at or below numeric criteria at the three stations as the Upper and Lower Basin states continue to develop their compact-apportioned waters. One of the components of the Plan consists of the placing of effluent limitations, through the National Pollutant Discharge Elimination System (NPDES) permit program, on industrial and municipal discharges.

The purpose of this policy is to provide more detailed guidance in the application of salinity standards developed pursuant to Section 303 and through the NPDES permitting authority in the regulation of municipal and industrial sources. (See Section 402 of the Federal Water Pollution Control Act.) This policy is applicable to discharges that would have an impact, either direct or indirect on the lower main stem of the Colorado River System. The lower main stem is defined as that portion of the main river from Hoover Dam to Imperial Dam.

I. Industrial Sources

The Salinity Standards state that "the objective for discharges shall be a no-salt return policy whenever practicable." This is the policy that shall be followed in issuing NPDES discharge permits for all new industrial sources, and upon the reissuance of permits for all existing industrial sources, except as provided herein. The following addresses those cases where no-discharge of salt may be deemed not to be practicable.

A. New Construction

1. New construction is defined as any facility from which a discharge may occur, the construction of which is commenced after October 18, 1975. (Date of submittal of water quality standards as required by 40 CFR 120, December 11, 1974.) Appendix A provides guidance on new construction determination.

   a. The permitting authority may permit the discharge of salt upon a satisfactory demonstration by the permittee that it is not practicable to prevent the discharge of all salt from proposed new construction.

   b. The demonstration by the applicant must include information on the following factors relating to the potential discharge:

      (1) Description of the proposed new construction.

      (2) Description of the quantity and salinity of the water supply.

      (3) Description of water rights, including diversions and consumptive use quantities.

      (4) Alternative plans that could reduce or eliminate salt discharge. Alternative plans shall include:

         (a) Description of alternative water supplies, including provisions of water reuse, if any.

         (b) Description of quantity and quality of proposed discharge.

         (c) Description of how salts removed from discharges shall be disposed of to prevent such salts from entering surface waters or groundwater aquifers.

         (d) Costs of alternative plans in dollars per ton of salt removed.

      (5) Of the alternatives, a statement as to the one plan for reduction of salt discharge that the applicant recommends be adopted.

(6) Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

c. In determining what permit conditions shall be required, the permit issuing authority shall consider, but not be limited to the following:

(1) The practicability of achieving no discharge of salt.

(2) Where no discharge is determined not to be practicable:

(a) The impact of the total proposed salt discharge of each alternative on the lower main stem in terms of both tons per year and concentration.

(b) Costs per ton of salt removed from the discharge for each plan alternative.

(c) Capability of minimizing salinity discharge.

(3) With regard to both points, one and two above, the compatibility of state water laws with either the complete elimination of a salt discharge or any plan for minimizing a salt discharge.

(4) The no-salt discharge requirement may be waived in those cases where the salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less. Evaluation will be made on a case-by-case basis.

B. Existing Facilities

1. The permitting authority may permit the discharge of salt upon a satisfactory demonstration by the permittee that it is not practicable to prevent the discharge of all salt from an existing facility.

2. The demonstration by the applicant must include, in addition to that required under Section I,A,l,b; the following factors relating to the potential discharge:

a. Existing tonnage of salt discharged and volume of effluent.

b. Cost of modifying existing industrial plant to provide for no salt discharge.

c. Cost of salt minimization.

3. In determining what permit conditions shall be required, the permit issuing authority shall consider the items presented under I, A, 1, c (2), and in addition; the annual costs of plant modification in terms of dollars per ton of salt removed for:

   a. No salt return.

   b. Minimizing salt return.

4. The no-salt discharge requirement may be waived in those cases where the salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less. Evaluation will be made on a case-by-case basis.

II. Municipal Discharges

The basic policy is that a reasonable increase in salinity shall be established for municipal discharges to any portion of the Colorado River stream system that has an impact on the lower main stem. The incremental increase in salinity shall be 400 mg/l or less, which is considered to be a reasonable incremental increase above the flow weighted average salinity of the intake water supply.

A. The permitting authority may permit a discharge in excess of the 400 mg/l incremental increase at the time of issuance or reissuance of a NPDES discharge permit, upon satisfactory demonstration by the permittee that it is not practicable to attain the 400 mg/l limit.

B. Demonstration by the applicant must include information on the following factors relating to the potential discharge:

   1. Description of the municipal entity and facilities.

   2. Description of the quantity and salinity of intake water sources.

   3. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

   4. Description of water rights, including diversions and consumptive use quantities.

5. Description of the wastewater discharge, covering location, receiving waters, quantity, salt load, and salinity.

6. Alternative plans for minimizing salt contribution from the municipal discharge. Alternative plans should include:

   a. Description of system salt sources and alternative means of control.

   b. Cost of alternative plans in dollars per ton, of salt removed from discharge.

7. Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

C. In determining what permit conditions shall be required, the permit issuing authority shall consider the following criteria including, but not limited to:

1. The practicability of achieving the 400 mg/l incremental increase.

2. Where the 400 mg/l incremental increase is not determined to be practicable:

   a. The impact of the proposed salt input of each alternative on the lower main stem in terms of tons per year and concentration.

   b. Costs per ton of salt removed from discharge of each alternative plan.

   c. Capability of minimizing the salt discharge.

D. If, in the opinion of the permitting authority, the data base for the municipal waste discharger is inadequate, the permit will contain the requirement that the municipal waste discharger monitor the water supply and the wastewater discharge for salinity. Such monitoring program shall be completed within 2 years and the discharger shall then present the information as specified above.

E. Requirements for establishing incremental increases may be waived in those cases where the incremental salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less. Evaluation will be made on a case-by-case basis.

F. All new and reissued NPDES permits for all municipalities shall require monitoring of the salinity of the intake water supply and the wastewater treatment plant effluent in accordance with the following guidelines:

Treatment Plant Desicin Capacity	Monitoring Frequency	Type of Sample
<1.0 MGD*	Quarterly	Discrete
1.0 - 5.0 MGD	Monthly	Composite
>5.0 - 50.0 MGD	Weekly	Composite
50.0 MGD	Daily	Composite

1. Analysis for salinity may be either as total dissolved solids (TDS) or be electrical conductivity where a satisfactory correlation with TDS has been established. The correlation should be based on a minimum of five different samples.

2. Monitoring of the intake water supply may be at a reduced frequency where the salinity of the water supply is relatively uniform.

APPENDIX A

Guidance on New Construction Determination

For purposes of determining a new construction, a source should be considered new if by October 18, 1975, there has not been:

I. Significant site preparation work such as major clearing or excavation; and/or

II. Placement, assembly or installation of unique facilities or equipment at the premises where such facilities or equipment will be used; and/or

III. Any contractual obligation to purchase unique facilities or equipment. Facilities and equipment shall include only the major items listed below, provided that the value of such items represents a substantial commitment to construct the facility:

A. structures; or
B. structural materials; or
C. machinery; or
D. process equipment; or
E. construction equipment.

IV. Contractual obligation with a firm to design, engineer, and erect a completed facility (i.e., a turnkey plant).

POLICY FOR USE OF
BRACKISH AND/OR SALINE WATERS
FOR INDUSTRIAL PURPOSES

Adopted by
The Colorado River Basin Salinity Control Forum

September 11, 1980

The states of the Colorado River Basin, the federal Executive Department, and the Congress have all adopted as a policy that the salinity in the lower main stem of the Colorado River shall be maintained at or below the flow-weighted average values found during 1972, while the Basin states continue to develop their compact-apportioned waters. In order to achieve this policy, all steps which are practical and within the framework of the administration of states' water rights must be taken to reduce the salt load of the river. One such step was the adoption in 1975 by the Forum of a policy regarding effluent limitations for industrial discharges with the objective of "no-salt return" wherever practicable. Another step was the Forum's adoption in 1977 of the "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program." These policies are part of the basinwide plan of implementation for salinity control which has been adopted by the seven Basin states.

The Forum finds that the objective of maintaining 1972 salinity levels would be served by the exercise of all feasible measures including, wherever practicable, the use of brackish and/or saline waters for industrial purposes.

The summary and page 32 of the Forum's 1978 Revision of the Water Quality Standards for Salinity state: "The plan also contemplates the use of saline water for industrial purposes whenever practicable,..." In order to implement this concept and thereby further extend the Forum's basic salinity policies, the Colorado River Basin states support the Water and Power Resources Service (WPRS) appraisal study of saline water collection, pretreatment and potential industrial use.

The Colorado River Basin contains large energy resources which are in the early stages of development. The WPRS study should investigate the technical and financial feasibility of serving a significant portion of the water requirements of the energy industry and any other industries by the use of Basin brackish and/or saline waters. The Forum recommends that:

I. The Colorado River Basin states, working with federal agencies, identify, locate and quantify such brackish and/or saline water sources.

II. Information on the availability of these waters be made available to all potential users.

III. Each state encourage and promote the use of such brackish and/or saline waters, except where it would not be environmentally sound or economically feasible, or would significantly increase consumptive use of Colorado River System water in the state above that which would otherwise occur.

IV. The WPRS, with the assistance of the states, encourages and promotes the use of brackish return flows from federal irrigation projects in lieu of fresh water sources, except where it

would not be environmentally sound or economically feasible, or would significantly increase consumptive use of Colorado River System water.

V. The WPRS considers a federal contribution to the costs of industrial use of brackish and/or saline water, where cost-effective, as a joint private-government salinity control measure. Such activities shall not delay the implementation of the salinity control projects identified in Title II of P.L. 93-320.

POLICY FOR IMPLEMENTATION OF COLORADO RIVER SALINITY STANDARDS THROUGH THE NPDES PERMIT PROGRAM FOR INTERCEPTED GROUND WATER

Adopted by
The Colorado River Basin Salinity Control Forum

October 20, 1982

The States of the Colorado River Basin in 1977 agreed to the "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program" with the objective for industrial discharge being "no-salt return" whenever practicable. That policy required the submittal of information by the applicant on alternatives, water rights, quantity, quality, and costs to eliminate or minimize the salt discharge. The information is for use by the NPDES permit-issuing agency in evaluating the practicability of achieving "no-salt" discharge.

There are mines and wells in the Basin which discharge intercepted ground waters. The factors involved in those situations differ somewhat from those encountered in other industrial discharges. Continued development will undoubtedly result in additional instances in which permit conditions must deal with intercepted ground water.

The discharge of [1]intercepted ground water needs to be evaluated in a manner consistent with the overall objective of "no-salt return" whenever practical. The following provides more detailed guidance for those situations where ground waters are intercepted with resultant changes in ground-water flow regime.

I. The "no-salt" discharge requirement may be waived at the option of the permitting authority in those cases where the discharged salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year whichever is less. Evaluation will be made on a case-by-case basis.

II. Consideration should be given to the possibility that the ground water, if not intercepted, normally would reach the Colorado River System in a reasonable time frame. An industry desiring such consideration must provide detailed information including a description of the topography, geology, and hydrology. Such information must include direction and rate of ground-water flow; chemical quality and quantity of ground water; and the location, quality, and quantity of surface streams and springs that might be affected. If the information adequately demonstrates that the ground water to be intercepted normally would reach the river system in a reasonable time frame and would contain approximately the same or greater salt load than if intercepted, and if no significant localized problems would be created, then the permitting agency may waive the "no-salt" discharge requirement.

III. In those situations where the discharge does not meet the criteria in I or II above, the applicant will be required to submit the following information for consideration:

---

[1] The term "intercepted ground water" means all ground water encountered during mining or other industrial operations.

A. Description of the topography, geology, and hydrology. Such information must include the location of the development, direction and rate of ground-water flow, chemical quality and quantity of ground water, and relevant data on surface streams and springs that are or might be affected. This information should be provided for the conditions with and without the project.

B. Alternative plans that could substantially reduce or eliminate salt discharge. Alternative plans must include:

1. Description of water rights, including beneficial uses, diversions, and consumptive use quantities.

2. Description of alternative water supplies, including provisions for water reuse, if any.

3. Description of quantity and quality of proposed discharge.

4. Description of how salts removed from discharges shall be disposed of to prevent their entering surface waters or ground-water aquifers.

5. Technical feasibility of the alternatives.

6. Total construction, operation, and maintenance costs; and costs in dollars per ton of salt removed from the discharge.

7. Closure plans to ensure termination of any proposed discharge at the end of the economic life of the project.

8. A statement as to the one alternative plan for reduction of salt discharge that the applicant recommends be adopted, including an evaluation of the technical, economic, and legal practicability of achieving no discharge of salt.

9. Such information as the permitting authority may deem necessary.

IV. In determining whether a "no-salt" discharge is practicable, the permit-issuing authority shall consider, but not be limited to, the water rights and the technical, economic, and legal practicability of achieving no discharge of salt.

V. Where "no-salt" discharge is determined not to be practicable the permitting authority shall, in determining permit conditions, consider:

A. The impact of the total proposed salt discharge of each alternative on the lower main stem in terms of both tons per year and concentration.

B. Costs per ton of salt removed from the discharge for each plan alternative.

C. The compatibility of state water laws with each alternative.

D. Capability of minimizing salinity discharge.

E. The localized impact of the discharge.

F. Minimization of salt discharges and the preservation of fresh water by using intercepted ground water for industrial processes, dust control, etc. whenever it is economically feasible and environmentally sound.

POLICY FOR IMPLEMENTATION OF COLORADO RIVER SALINITY STANDARDS THROUGH THE NPDES PERMIT PROGRAM FOR FISH HATCHERIES

Adopted by
The Colorado River Basin Salinity Control Forum

October 28, 1988

The states of the Colorado River Basin in 1977 adopted the "Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program." The objective was for "no-salt return" whenever practicable for industrial discharges and an incremental increase in salinity over the supply water for municipal discharges. The Forum addressed the issue of intercepted ground water under the 1977 policy, and adopted a specific policy dealing with that type of discharge.

A specific water use and associated discharge which has not been here-to-fore considered is discharges from fish hatcheries. This policy is limited exclusively to discharges from fish hatcheries within the Colorado River Basin. The discharges from fish hatcheries need to be addressed in a manner consistent with the 1977 and 1980 Forum policies.

The basic policy for discharges from fish hatcheries shall permit an incremental increase in salinity of 100 mg/l or less above the flow weighted average salinity of the intake supply water. The 100 mg/l incremental increase may be waived if the discharged salt load reaching the Colorado River system is less than one ton per day, or 350 tons per year, whichever is less. Evaluation is to be made on a case-by-case basis.

I. The permitting authority may permit a discharge in excess of the 100 mg/l incremental increase at the time of issuance or reissuance of a NPDES discharge permit. Upon satisfactory demonstration by the permittee that it is not practicable to attain the 100 mg/l limit.

II. Demonstration by the applicant must include information on the following factors relating to the potential discharge:

A. Description of the fish hatchery and facilities.

B. Description of the quantity and salinity of intake water sources.

C. Description of salt sources in the hatchery.

D. Description of water rights, including diversions and consumptive use quantities.

E. Description of the discharge, covering location, receiving waters, quantity salt load, and salinity.

F. Alternative plans for minimizing salt discharge from the hatchery. Alternative plans should include:

1. Description of alternative means of salt control.

2. Cost of alternative plans in dollars per ton, of salt removed from discharge.

G. Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

III. In determining what permit conditions shall be required, the permit-issuing authority shall consider the following criteria including, but not limited to:

A. The practicability of achieving the 100 mg/l incremental increase.

B. Where the 100 mg/l incremental increase is not determined to be practicable:

1. The impact of the proposed salt input of each alternative on the lower main stem in terms of tons per year and concentration.

2. Costs per ton of salt removed from discharge of each alternative plan.

3. Capability of minimizing the salt discharge.

IV. If, in the opinion of the permitting authority, the database for the hatchery is inadequate, the permit will contain the requirement that the discharger monitor the water supply and the discharge for salinity. Such monitoring program shall be completed within two years and the discharger shall then present the information as specified above.

V. All new and reissued NPDES permits for all hatcheries shall require monitoring of the salinity of the intake water supply and the effluent at the time of peak fish population.

A. Analysis for salinity may be either as total dissolved solids (TDS) or be electrical conductivity where a satisfactory correlation with TDS has been established. The correlation should be based on a minimum of five different samples.

APPENDIX C

NPDES Permits

LEGEND

NPDES PERMITS
EXPLANATION CODES

COLORADO RIVER BASIN SALINITY CONTROL FORUM
October 1, 1997 — September 30, 1998

NPDES permits are reviewed under two different criteria under Forum policy; these being municipal and industrial. In order for a permittee to be in compliance under the municipal criteria, the increase in concentration between inflow and outflow can not be greater than 400 mg/L. Forum industrial criteria requires that no industrial user discharges more than 1.00 ton/day. Under Forum policy there can be granted exceptions to these limitations by the states. The following gives an explanation of the current status of the NPDES permits. Because at any given time many of the approximate 650 permits identified in this list are being reviewed, reissued, and/or terminated, and new discharge permits are being filed, this list must be considered as being subject to frequent change.

MUNICIPAL

(M) Municipal user in compliance with Forum policy.

(M-1) Permit has expired or been revoked. No discharge.

(M-2) Permittee did not discharge during the reporting period.

(M-3) Measurement of TDS is not currently required, but the state and/or EPA plans to require measurements of both inflow and outflow when the permit is reissued.

Measurements of inflow are not consistent with Forum policy;

(M-4A) Therefore, it is not known whether or not this municipal user is in compliance.

(M-4B) However, since outflow concentration is less than 500 mg/L it is presumed that this permit is not in violation of the ≤400 mg/L increase.

(M-5) Permittee is in violation of Forum policy in that there is an increase in concentration of >400 mg/L over the source waters.

(M-5A) The state is currently working to bring permittee into compliance.

(M-6) This permit requires no discharge or discharge only under rare and extreme hydrologic conditions. Thus, flow and concentration measurements are not required.

(M-7) Insufficient data to know the status of this permit.

* Permit issued to a federal agency or an Indian tribe and the responsibility of EPA.

INDUSTRIAL

(I) Industrial user in compliance with Forum policy.

(I-1) Permit has expired or been revoked. No discharge.

(I-2) Permittee did not discharge during the reporting period.

(I-3) Measurement of TDS is not currently required, but the state and/or EPA plans to require measurements of both volume and concentration of outflow when the permit is reissued.

(I-4) Either concentration or volume of outflow are not currently being reported, thus the permittee is in violation of Forum policy. It is not known if the discharge is in excess of the <1.00 ton/day requirement.

Permittee appears to be in violation of Forum policy in that discharge of salts is >1.00 ton/day.

(I-5A) No provision has been made allowing this violation of Forum policy.

(I-5B) Though discharge is >1.00 ton/day, in keeping with Forum policy the permittee has demonstrated the salt reduction is not practicable and the requirement has been waived.

(I-5C) The use of ground water under this permit is for geothermal energy and only heat is extracted. The intercepted salt and water are naturally tributary to the Colorado River System and hence, this discharge does not increase salt in the river. The permit is covered by the Forum's policy on intercepted ground waters.

(I-5D) This permit is in compliance with the Forum's policy for fish hatcheries. The use of the water is a one-time pass through, and the incremental increase in salinity is ≤ 100 mg/l.

(I-5E) This permit is for the interception and passage of ground waters and thus is excepted under the Forum's policy on intercepted ground waters.

(I-6) This permit requires no discharge or discharge only under rare and extreme hydrologic conditions. Thus, flow and concentration measurements are not required.

(I-7) Insufficient data to know the current status of this permit.

LEGEND (continued)
NPDES PERMITS
REACH DEMARCATIONS

COLORADO RIVER BASIN SALINITY CONTROL FORUM

In order to provide a better understanding of the location of the various NPDES permits and the geographical sequence in the Colorado River System, each of the following NPDES permits is identified with a Colorado River reach number. The reach numbers have their origin in the old CRSS river model. Though this model is no longer used, the reach numbers assist in understanding the general location of the permits. The reaches are defined as:

100	Upper Main Stem	from headwaters of Colorado River to Colorado River near Cameo
190	Taylor Park	from headwaters of Gunnison River to above Blue Mesa Reservoir
200	Blue Mesa	from above Blue Mesa Reservoir to below Blue Mesa Dam
210	Morrow Point	from below Blue Mesa Dam to Crystal Reservoir
220	Lower Gunnison	from Crystal Reservoir to confluence with Colorado River
300	Grand Valley	from Colorado River near Cameo to confluence with Green River
310	Dolores River	from headwaters of Dolores River to confluence with Colorado River
401	Fontenelle	from headwaters of Green River to Green River near Green River, WY
411	Flaming Gorge	from Green River near Green River, WY to confluence with White and Duchesne Rivers
500	Yampa River	from headwaters of Yampa River to confluence with Green River
510	White River	from headwaters of White River to confluence with Green River
600	Green River	Green River from confluence with White and Duchesne Rivers to confluence with Colorado River
610	Duchesne River	from headwaters of Duchesne River to confluence with Green River
700	Lake Powell	Colorado River from confluence of with Green River to Lees Ferry
710	San Rafael River	from headwaters of San Rafael River to confluence with Green River
801	Upper San Juan River	from headwaters of San Juan River to San Juan near Bluff
802	Lower San Juan River	from San Juan near Bluff to confluence with Lake Powell
900	Glen Canyon to Lake Mead	Colorado River from Lees Ferry to backwaters of Lake Mead
905	Virgin River	from headwaters of Virgin River to backwaters of Lake Mead
910	Lake Mead	from backwaters of Lake Mead to Colorado River below Hoover Dam
920	Lake Mohave	Colorado River from below Hoover Dam down to I-40 bridge
930	Lake Havasu	Colorado River from I-40 bridge to below Parker Dam
940	Parker Dam to Imperial Dam	Colorado River from below Parker Dam to above Imperial Dam
945	Imperial Dam	Colorado River from above Imperial Dam to Gila and Yuma users
950	Below Imperial Dam	Colorado River from Gila and Yuma Users to Mexico

NPDES PERMITS

Colorado River Basin Salinity Control Forum

October 1, 1997 - September 30, 1998

NPDES #	REACH	NAME	CONCENTRATION MG/L	FLOW RATE MGD	SALT LOAD TONS/DAY	EXPLANATION CODE
AZ0022560	900	BIA Keams Canyon		0.030	0.00	M-3*
AZ0110213	900	BIA Low Mountain Boarding School		0.014	0.00	M-3*
AZ0021610	900	Cameron Trading Post		0.054	0.00	M-3
AZ0023990	930	CAWCD - Havasu Pumping Plant		0.780	0.00	I-3
AZ0021024	920	Citizens Utilities/Riverbend WWTP	0	0.170	0.00	M-1
AZ0022462	940	Colorado River Indian Tribe WTP		0.040	0.00	M-3*
AZ0021415	940	Colorado River Joint Venture WWTP	75	1.200	0.38	M*
AZ0022098	940	Le Pera School - Parker S.D. #27	0	0.000	0.00	M-1
AZ0023647	920	Mohave Topock Compressor Station	1300	0.144	0.78	I
AZ0022195	900	NTUA/Ganado	400	0.400	0.67	M-6*
AZ0022471	801	NTUA/Kaibeto		0.100	0.00	M-3*
AZ0022802	900	NTUA/Rough Rock Lagoons		0.007	0.00	M-3*
AZ0020265	801	NTUA/Chinle	400	0.783	1.31	M-6*
AZ0024236	900	NTUA/Jeddito		0.037	0.00	M-3*
AZ0024228	900	NTUA/Pinon		0.030	0.00	M-3*
AZ0020281	801	NTUA/Kayenta	400	0.900	1.50	M-6*
AZ0021920	801	NTUA/Many Farms		0.070	0.00	M-6*
AZ0020290	900	NTUA/Tuba City	400	1.100	1.84	M-6*
AZ0021555	900	NTUA/Window Rock-Ft. Defiance	400	1.320	2.20	M-6*
AZ0022284	900	Parker, Town of WTP		0.013	0.00	M-3
AZ0022772	900	St. Johns, City of POTW		0.500	0.00	M-3
AZ0021474	900	Stone Forest Industries/Flagstaff	0	0.015	0.00	I-2
AZ0110248	920	USBR/Davis Dam WTP		0.027	0.00	M-3
AZ0110019	700	USBR/Glen Canyon CRSP	350	0.015	0.02	M
AZ0110329	910	USBR/Hoover Dam	150	0.055	0.03	M
AZ0000132	920	USFWS/Willow Beach Fish Hatchery	10	20.800	0.87	I-5D
AZ0110426	900	USNPS/Grand Canyon/North Rim		0.150	0.00	M-3
AZ0023621	900	USNPS/Grand Canyon/Garden Creek	100	0.450	0.19	M
AZ0022152	900	USNPS/Grand Canyon/South Rim		0.750	0.00	M-3
AZ0023523	920	USNPS/Katherine Landing WTP	100	0.200	0.08	M
AZ0023833	900	Winslow, City of POTW		2.200	0.00	M-3
CA0104205	920	NEEDLES, CITY OF	1231	0.960	4.93	M
CA7000005	940	USBR, PARKER DAM AND POWER PLANT DWF	45	0.003	0.00	M
COG584012	190	ALMONT WWTP	337	0.008	0.01	M
CO0042447	100	AMERICAN ATLAS #1, LTD, LLP	2853	0.093	1.11	I-5A
CO0026468	801	AMORELLI, JOE AND CHERYL	370	0.003	0.00	M
CO0026387	100	ASPEN CONSOLIDATED SAN DISTRCT	568	2.062	4.89	M
CO0044750	100	ASPEN GLEN WATER & SAN. DIST.	524	0.005	0.01	M
CO0022721	100	ASPEN VILLAGE HOMEOWNERS ASSN.	366	0.024	0.04	M
COG640066	100	ASPEN, CITY OF - WATER DEPT.	299	0.135	0.17	I
CO0021491	100	BASALT SANITATION DISTRICT	321	0.313	0.42	M
COG640078	100	BASALT, TOWN OF	50	0.100	0.02	I
COG584028	100	BATTLEMENT MESA METO. DIST.	755	0.336	1.06	M
CO0020273	801	BAYFIELD SANITATION DISTRICT	263	0.238	0.26	M
CO0039276	801	BAYFIELD SANITATION DISTRICT	410	0.017	0.03	M
CO0044377	220	BEAR COAL COMPANY	3538	0.032	0.47	I
CO0042111	801	BEAR, RUEDI	3234	0.253	3.41	I-5C
COG581011	801	BENSON, LARRY W & MABEL A.	320	0.008	0.01	M
CO0038024	510	BLUE MOUNTAIN ENERGY, INC.	722	0.017	0.05	I
CO0020826	100	BLUE RIVER WWTP	353	2.443	3.60	M

NPDES PERMITS

Colorado River Basin Salinity Control Forum

October 1, 1997 - September 30, 1998

NPDES #	REACH	NAME	CONCENTRATION MG/L	FLOW RATE MGD	SALT LOAD TONS/DAY	EXPLANATION CODE
CO0033685	220	BOWIE RESOURCES LIMITED	610	0.011	0.03	I
COG850039	220	BOWIE RESOURCES, LIMITED	1295	0.054	0.29	I
CO0021539	100	BRECKENRIDGE SAN DISTRICT	244	1.598	1.63	M
CO0029211	100	BRECKENRIDGE SAN DISTRICT	0	0.000	0.00	M-2
CO0027197	100	BRECKENRIDGE SANITATION DIST.	0	0.000	0.00	M-2
COG584003	100	CANYON CREEK ESTATE HOA	1143	0.013	0.06	M
COG640027	100	CARBONDALE, TOWN OF	84	0.196	0.07	I
CO0026751	100	CARBONDALE, TOWN OF	375	0.314	0.49	M
COG640015	220	CEDAREDGE, TOWN OF	72	0.029	0.01	I
CO0031984	220	CEDAREDGE, TOWN OF	320	0.193	0.26	M
CO0033260	300	CLIFTON SANITATION DISTRICT #1	614	0.041	0.11	M
CO0033791	300	CLIFTON SANITATION DISTRICT #2	590	0.777	1.92	M-5A
CO0035394	190	CLIMAX MOLYBDENUM CO.-KEYSTONE	793	0.415	1.37	I-5B
CO0000248	100	CLIMAX MOLYBDENUM COMPANY	1269	30.270	160.30	I-5B
CO0040487	100	COLLBRAN, TOWN OF	884	0.127	0.47	M
COG584032	100	COLO DEPARTMENT OF CORRECTIONS	432	0.025	0.05	M
CO0044091	100	COLO DIV OF WILDLIFE-WINDY	272	0.000	0.00	M-2
CO0042579	220	COLO DIV PARKS & OUTDOOR REC	395	0.005	0.01	M
COG130001	100	COLORADO DIVISION OF WILDLIFE	275	7.499	8.61	I-5D
COG130004	190	COLORADO DIVISION OF WILDLIFE	112	11.471	5.36	I-5D
COG130005	801	COLORADO DIVISION OF WILDLIFE	214	3.324	2.96	I-5D
COG130006	190	COLORADO DIVISION OF WILDLIFE	214	6.523	5.83	I-5D
COG130007	100	COLORADO DIVISION OF WILDLIFE	173	2.754	1.99	I-5D
COG130011	100	COLORADO DIVISION OF WILDLIFE	273	33.939	38.73	I-5D
COG500184	100	COLORADO YULE MARBLE COMPANY	155	0.024	0.02	I
COG850017	500	COLOWYO COAL COMPANY L.P.	630	0.232	0.61	I
COG500245	500	CONNELL RESOURCES, INC.	450	1.512	2.84	I-5B
CO0038440	100	CONRAD, JOHN J.	170	0.001	0.00	M
COG500155	300	CORN CONSTRUCTION COMPANY	5920	1.010	24.95	I-5E
CO0020125	801	CORTEZ SAN DIST - NORTH WWTF	791	0.219	0.72	M
CO0027880	801	CORTEZ SAN DIST - SOUTH WWTF	505	0.584	1.23	M
CO0027545	801	CORTEZ SAN DIST - SW WWTF	613	0.134	0.34	M
CO0036251	310	COTTER CORPORATION	2100	0.015	0.13	I
COG581002	100	COTTONWOOD SPRINGS MHP	1310	0.062	0.34	M
CO0043893	100	COVERED BRIDGE BUILDING LTD.	565	0.064	0.15	I
CO0040037	500	CRAIG, CITY OF - WWTP	767	1.278	4.09	M-5
CO0037729	220	CRAWFORD, TOWN OF	271	0.141	0.16	M
CO0031836	190	CRESTED BUTTE SOUTH METRO DIST	355	0.037	0.05	M
CO0034142	500	CYPRUS EMPIRE CORP. EAGLE MINE	310	0.592	0.77	I
CO0031445	801	DAVIS, JR., ROBERT H. DBA	480	0.003	0.01	M
CO0023418	100	DEBEQUE, TOWN OF	753	0.016	0.05	M
COG500209	220	DELTA SAND AND GRAVEL COMPANY	728	1.875	5.70	I-5E
CO0039641	220	DELTA, CITY OF	1242	0.912	4.73	M
COG640006	100	DILLON, TOWN OF - WTP	0	0.054	0.00	I-2
CO0040509	801	DOLORES, TOWN OF	485	0.157	0.32	M
CO0023434	310	DOVE CREEK, TOWN OF	863	0.040	0.14	M
COG500243	500	DUCKELS CONST. DBA YAMPA AGGRE	158	1.012	0.67	I
CO0023876	100	DUNDEE REALITY USA, INC.	609	0.008	0.02	M
CO0024082	801	DURANGO, CITY OF	357	1.910	2.84	M
CO0021369	100	EAGLE RIVER WATER & SAN. DIST.	386	1.834	2.95	M
CO0024431	100	EAGLE RIVER WATER & SAN. DIST.	348	1.953	2.84	M
CO0037311	100	EAGLE RIVER WATER & SAN. DIST.	662	0.739	2.04	M-5

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COLORADO RIVER BASIN SALINITY CONTROL ADVISORY COUNCIL

January 1996

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1995 ANNUAL REPORT
ON THE
COLORADO RIVER BASIN
SALINITY CONTROL PROGRAM

COLORADO RIVER BASIN
SALINITY CONTROL ADVISORY COUNCIL

January 1996

BACKGROUND

Public Law 93-320, also known as the "Colorado River Basin Salinity Control Act of 1974" (Act), authorized the construction, operation, and maintenance of works in the Colorado River Basin to control the salinity of Colorado River water available for use in the United States and Mexico. Section 204 of the Act established the Colorado River Basin Salinity Control Advisory Council (Council). A charter for the Council was originally approved by the Secretaries of the Departments of the Interior and Agriculture and the Administrator of the Environmental Protection Agency (EPA) on February 6, 1976. It was revised on June 22, 1976, and has been renewed biennially. The Council receives reports from the federal agencies involved in salinity control activities and makes recommendations to them regarding appropriate methods for controlling the salinity of the Colorado River in this annual report.

The Council is comprised of up to three members from each of the seven Colorado River Basin states. Representatives are appointed by Governors and current membership is shown on Attachment A. William J. Miller, New Mexico, acts as Chairman of the Council and Gerald R. Zimmerman, California, serves as Vice Chairman. Advisory Council members are, for the most part, also members of the Colorado River Basin Salinity Control Forum (Forum). The Forum is an organization created in 1974 by the seven Colorado River Basin states which was established for the purpose of interstate cooperation and to provide the states with the information necessary to comply with the Water Quality Standards for the Colorado River and Section 303 of the Clean Water Act. The Governors of the seven states also appoint Forum members.

The Bureau of Reclamation (Reclamation) Salinity Coordinator serves as staff for the Council. In addition, the permanent Work Group of the Colorado River Basin Salinity Control Forum continues to serve the Council and the Forum in the capacity of a technical review and study team. The Council is further assisted by the Forum's Executive Director.

The Council met in Lake Havasu City, Arizona, on October 18, 1995. At that meeting, the Council received reports from and made inquiries of the federal agencies involved in salinity control, and approved the budget recommendations contained in this report. The Council also made time available for public comment and one member of the public responded. The record was left open to allow written comment by the public, to date no comments have been received.

COUNCIL COMMENTS AND RECOMMENDATIONS

The 1993 Review, Water Quality Standards for Salinity - Colorado River System Final Report, (1993 Review) October 1993, prepared by the Forum, describes the numeric criteria for salinity, the implementation plan, the individual salinity control projects and their status. The approval of the 1993 Review has taken longer than expected due to the inclusion of Endangered Species Act Section 7 consultation as part of the Environmental Protection Agency (EPA) approval. The next Review will be prepared in 1996 and the Work Group will coordinate its drafting with EPA and the Fish & Wildlife Service in hopes of facilitating their review.

The Council believes that the federal agencies have done an exemplary job coordinating and developing the implementation plan. The Council urges them to continue to consult with the Forum and Work Group with regard to proposed program changes, program evaluations, and implementation schedule revisions for salinity control projects. The Council also requests that the federal agencies identify where agency responsibility for salinity control currently lies, and that this information be presented to the Forum's Executive Director at the earliest possible date. The Council subscribes to the implementation plan described in the 1993 Review. However, insufficient funding levels have caused delays in implementation of salinity control projects in the plan which could result in exceedence of the numeric criteria. It is imperative that the federal agencies vigorously pursue adequate funding for salinity control projects in the administration's budget request each year and encourage Congress to appropriate the funds

necessary to carry out the salinity control activities set forth in the 1993 Review in a timely manner.

Bureau of Reclamation

On July, 28 of 1995, Reclamation's Salinity Control Program was amended by the signing of Public Law 104-20. The Council supported this legislation. However, there is now concern that implementation of the program as it is currently envisioned by Reclamation may degrade the existing relationship between Reclamation and the Council. An example of this change is the fact that the draft report to be submitted to Congress, as required under the new law, was reviewed by the Council and the Forum, but ultimately will be submitted without Council or Forum endorsement. In the past, Reclamation would have sought such an endorsement prior to submitting the report.

The Council is pleased that the current administration continues to financially support Reclamation's basinwide salinity control program. This insures that Reclamation's projects will not be severely delayed by funding issues, nor will those portions of multi-agency projects which are Reclamation's responsibility. The Council recognizes Reclamation's accomplishments, most notably those in the Lower Gunnison Basin, Grand Valley, and Paradox Valley Units.

Bureau of Land Management

There has been significant organizational and personnel change in the Bureau of Land Management (BLM) and the salinity control program is now the responsibility of the newly formed National Applied Resource Sciences Center. The Council urges the BLM to continue its efforts to identify activities on public lands which can reduce salt loading of the Colorado River system and to continue to seek funding for salt reduction projects administered solely by BLM or in cooperation with state and other federal agencies.

The Council supports timely implementation of salt reduction projects; however due to lack of appropriate line item funding this has been difficult. The Council remains concerned that tracking of funding and expenditures and identification and quantification of salinity control measures will continue to be difficult due to the watershed management concept of land management utilized by the BLM that does not specifically recognize the impact of activities and projects on the salinity of ground and surface water originating on or flowing from BLM administered lands. The Council recommends that the BLM incorporate in its ecosystem land planning activities the evaluation and reduction of salt discharges into the Colorado River system. The Council recommends that the BLM continue developing salt budget accounting fund identification programs developed in cooperation with the Forum's Work Group and proceed with efforts to identify and plug flowing saline wells.

U.S. Geological Survey

The Council is pleased that the current administration continues to support the U.S. Geological Survey (USGS) program as it is a federal obligation to provide the water quality and hydrologic data collection and interpretive studies necessary to meet the objectives of and enable assessment of the progress of the salinity control program. The Council recognizes that the USGS plays a commendable role in fulfilling this federal obligation. However, there is concern that information may become less available due to organizational, personnel, and budget changes. The Council urges that continued operation of existing long-term water quality and quantity monitoring stations be given the highest priority to enable the USGS to continue providing essential salinity data and interpretive analyses.

The Council requests that consultation be undertaken with the Forum and its Work Group prior to any plans to downsize the network of water quality and quantity stations that are necessary for the (1) interpretation of the effectiveness of specific salinity control projects and activities and (2) determination of unidentified salinity control opportunities. The Council is concerned

that current USGS plans to further downgrade the number of NASQAN stations, and others, will severely impact opportunities to evaluate and improve the salinity control program and may inhibit future investigative efforts by disrupting long term records of water quantity and quality at key stations. The Council urges USGS to pursue funding to maintain its essential, traditional program of basic water quantity and quality data collection.

Department of Agriculture

Administration of the salinity control program was consolidated within the Natural Resources Conservation Service (NRCS) and program management activities were coordinated out of the Washington, D.C. office due to reorganization within the agency. The Council reiterates its past recommendation that the U.S. Department of Agriculture (USDA) consider transferring primacy in the day-to-day salinity control responsibility to one of the Upper Colorado River Basin state or regional offices to provide more effective and accessible coordination and facilitation.

The Council recognizes that some of the most cost effective projects in the plan of implementation adopted by the states in the water quality standards for salinity control have been a result of USDA's on-farm salinity control program. Also, the Council recognizes the importance of a basin-wide approach to determining the implementation of the most cost effective measures to control salinity in the waters of the Colorado River. The Council fears that lack of coordination within USDA regional or state offices could lead to expenditure of funds for the implementation of less cost effective projects because the distribution of funds could be based on regional or state priorities rather than basin-wide priorities. The necessary coordination of USDA's salinity control activities could be accomplished by assigning one regional or state office primacy in determining the priority of projects basin-wide. That designated state or regional office could then be the focal point for coordination and consultation with the Council and the Colorado River Basin Salinity Control Forum. The Council recommends that the USDA, through NRCS, strive to ensure that the most cost effective projects

basin-wide are implemented and adequately funded to meet water quality objectives of P.L. 93-320.

Funding for the Cooperative Research, Extension and Education Service (CREES) is administered by NRCS. The CREES provides educational services and facilitates information transfer, which are two functions important to the success of the USDA salinity control program. The Council recognizes the important role of CREES and recommends that NRCS adequately fund CREES activities to support salinity control education and project implementation at the local level.

There has been concern over lack of adequate funding being requested and uncertainty within the agency regarding the future of the salinity control program due to the Agriculture Reconciliation Bill that is presently in the House and Senate. If passed, this bill could substantially impact the USDA salinity program by consolidating all agency conservation programs into a single large program. The Council is concerned that if the bill is passed as presently worded it may become extremely difficult to track and support funding for salinity control activities due to the elimination of specific line item appropriations for salt reduction projects.

The USDA program has played a major role in the implementation of cost-effective salinity control projects and will continue to be important to the success of the program. The on-farm program has been one of the most cost-effective components of the basinwide program and the Council recommends that the NRCS strive to insure that this component is not jeopardized.

There has been continued effort to resolve issues that arise between the USDA and the U.S. Fish and Wildlife Service regarding wetlands mitigation. The Council recognizes that progress is being made and supports the idea that both agencies are adopting more flexible policies that can minimize or resolve these issues. The Council recommends NRCS incorporate a wildlife replacement section in the National Handbook for the Colorado Salinity Control Program.

In summary, it is important to emphasize the USDA's role in preventing and controlling pollution. Under the Plan of Implementation in the 1993 Review, 58% of the projected salt removal will be accomplished by the USDA program and accordingly, recognition of the USDA's statutory role in maintaining the Colorado River water quality standards and their associated numeric criteria is essential.

MANAGEMENT AND BUDGET RECOMMENDATIONS

The Council's budget recommendations represent the minimum funding required for the program to be successful in maintaining salinity within the federally-mandated and state-adopted numeric criteria. All activities are consistent with the salinity control program set forth in the "1993 Review-Water Quality Standards for Salinity-Colorado River System Final Report." Unlike many other federal programs, the salinity program provides a significant amount of non-federal cost sharing (25-30 percent from the Upper Basin Fund and Lower Basin Development Fund) and an additional 30 percent of up-front cost share from the local participating farmers for the USDA onfarm program. The non-federal participants (land owners, irrigation districts, etc.) stand ready to contribute their up-front share of program costs and the Basin Funds are capable of reimbursing their appropriate share as the costs are incurred. The Council urges the federal agencies to vigorously pursue adequate funding so as to allow timely, continual implementation of the salinity program in a vigorous and cost-effective manner. The agencies funding requests should be in accordance with Executive Order 12088, which directs the head of each executive agency to take all necessary actions for the prevention, control and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

Table 1 contains the Council's recommendations for Congressional appropriations for FY 1997 and FY 1998. The Council hastens to point out that any shortfall in these funding levels will likely have to be offset by increased funding in subsequent years. In addition, delays in the funding of the salinity control program will result in much larger total federal expenditures to achieve and maintain the water quality standards for the Colorado River.

Table 1

FUNDING RECOMMENDATIONS

	Fiscal Years	
	1997	1998
DEPARTMENT OF THE INTERIOR		
Bureau of Reclamation [1]	$11,500,000	$11,500,000
(Original Program)	($5,500,000)	($5,300,000)
(1995 Authority)	($6,000,000)	($6,200,000)
Bureau of Land Management [2]	$3,700,000	$3,700,000
DEPARTMENT OF AGRICULTURE [3]	$9,800,000	$9,800,000
TOTAL FUNDS NEEDED	$25,000,000	$25,000,000

[1] The Council anticipates that Reclamation will also budget sufficient funds for required operation and maintenance of constructed units and for plan formulation.

[2] This line item identifies funds needed for improvements on BLM managed lands and includes $800,000 that is to be appropriated directly for salinity control for salinity activities. The Council anticipates that the BLM will also budget sufficient funds for inventory and ranking, planning, maintenance, monitoring and support.

[3] The Council anticipates that Agriculture will also budget sufficient funds for administration, technical information and education.

CONCLUSION

The Council recognizes and appreciates its responsibility for submitting to the federal agencies comments and recommendations on salinity control activities. The Council is generally pleased with the interagency efforts put forth in FY 1995, and looks forward to further success in the coming year. The Council wishes to thank the federal agencies for their written responses to last year's report. The Council requests that written responses to this year's report be provided by the next scheduled meeting of the Council, October 22, 1996, so that the Forum and the Federal agencies can cooperatively continue to expeditiously carry out the program.

Attachment A

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